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Is Cost of Capital an Outmoded Concept?

In the April, 1996, issue of *CFO Magazine*, Hans Storr, Executive Vice President and CFO of Philip Morris Cos. Inc. and Stephen Ross, Sterling Professor of Economics and Finance at Yale University strongly discounted the utility of the notion of a cost of capital. The subtitle of the article sums up its basic point: *A top CFO and leading finance theorist agree: cost of capital just doesn't measure up*. Ross asserts that the cost of capital is a somewhat old-fashioned notion and has become "enshrined in corporations because it works in analogy to what we know: net present value calculations."

Given that we "waste" a lot of time in finance classes talking about the notion of a cost of capital, asserting its importance and addressing many issues associated with estimating it, I think some justification of our efforts is warranted. This note is a discussion of the *CFO* article, addressing why these prestigious gentlemen (one a practitioner, the other one of the top finance professors) argue that the cost of capital is not a useful idea. Storr and Ross have seemingly different reasons for discarding the cost of capital, so the other point of this note is to try to understand the potential common ground between their seemingly incompatible positions.[1]

For the record, I think that the concept of a cost of capital is crucially important in financial decision making --- the main point being that the investment decisions being made

[1]Something the editor or moderator of the article should have better attempted to do.

are using *other people's money* and the cost of capital recognizes explicitly that these people (the investors of the company) *have alternative uses for this money*. If the management of the firm can not expect to do better than the *appropriately defined* cost of capital with these funds, then they have no business spending them. I think Ross's concept is not inconsistent with this perspective and I think that Storr's idea of decision making is not inconsistent with this perspective either.

To begin, the following are quotes from the article which state the key elements of Ross's argument and Storr's argument, respectively. Ross:

> *"...If you think about it, [what the discount rate should be] has nothing to do with what's been going on in finance for 25 years. In finance, we recognize now that maybe the single thing we know the most about is derivative asset pricing. And almost everything we do when we make an investment decision is really analogous to making a decision about which derivative to buy, whether it's a financial derivative or a "real" derivative. That is, if we are about to undertake a real project, and that real project has certain risks associated with it and certain returns we expect to get from it, we can use the same kinds of* ***valuation methodology*** *as we currently do for buying a security.[emphasis added]"*

Storr, in response to the question "How important is the cost of capital to Philip Morris":

> *"Let's take what I call recent history. Eleven years ago, Philip Morris made a major decision to invest outside the tobacco business in a bigger way than we had before. And so we acquired General Foods in 1985. That was a $5.6 billion investment, the biggest we'd ever made. Did any question of cost of capital come up? No. Why didn't it come up? Because it was a* ***strategic decision*** *to diversify the company, and we looked at the businesses where we would want to perform and where there were opportunities. The opportunities were very limited. So the question of what was available then was the big factor.*
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> *When we zeroed in on General Foods, we went through a detailed analysis of market share, their strategic decisions, the products they have, their cash flow, their related businesses, how they are structured, how they are internationally, what businesses they had in our core area. In the analysis of the financial statement, it was more a question of* ***what multiple we would have to pay, and what kind of financing we would need at prevailing rates****.*

In the final analysis, cost of capital was not a factor. We had strategically defined the investment, we knew what the cost of our incremental financing would be, and we had projected a cash flow from the business. We did ask, How does it compare to our business? And we simply had to answer, Well it's not quite comparable to tobacco business cash flows --- but it is a good, solid business. [emphasis added]."

Here is where the article needed a good journalist or a good moderator, someone to realize that, while Ross and Storr were seemingly saying fundamentally different things, that there was a level on which the positions were compatible. I have the feeling that this was Ross's job here, but he didn't do it very well.

To clarify Ross's position and explain why I emphasized the term *valuation methodology* in his quote, Ross is not saying we should scrap the notion of cost of capital *per se*, but that we should embrace a notion of valuation which recognizes that cash flows on projects are *contingent claims*, like the payoffs on options. He would prefer we take a "real asset option" approach to valuation (of projects, strategies, acquisition targets, etc.) rather than using discounted cash flow (DCF) **as it is typically applied**. On the quantitative approach/visceral approach debate, Ross is not saying to be less quantitative, less textbook oriented, but to be more so. He simply wants us to use a more theoretically appropriate textbook.[2]

Storr's statements sound diametrically opposed to this viewpoint, saying at several places in the article that he doesn't follow the "textbook" approach, that strategic decisions are made without consideration of cost of capital. At the same time, these statements could be interpreted[3] as meaning that decision makers see some "value" associated with a strategy that

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[2] In theory, he would get no arguments from academics here, although he would get some arguments concerning the practical application of real asset options valuations relative to a well constructed DCF analysis.

[3] See Brealey and Myers, pp. 512-513.

is not apparent by looking at a simple DCF analysis of its cash flows. Ross's original point could be used to bring these two viewpoints into a coherent vision for the article, that strategic value in investment decisions may take the form of options such as follow-up investment options, real flexibility options, abandonment options, tax options, etc., and that a more elaborate methodology of *valuation* would be able to quantify the value of strategic choices. It would also allow managers to make strategic decisions on a better quantified foundation rather than relying on the visceral approach.

Unfortunately, Ross's point has to be made to those already converted to thinking in terms of DCF to be effective. Explaining to someone who thinks you have to make decisions with your gut because of the limitations of quantitative models that there's a better quantiative model is not likely to get you far. So rather than bringing the two discussants onto the same page, for the rest of the second page of the article, Ross seems to argue that Storr should be using some kind of notion of cost of capital (which, of course, he should). Then Ross was allowed to change the subject entirely, discussing the debt policy of Philip Morris and the value of debt tax shields for almost an entire page.[4]

I have three further points to make about the *CFO* article: 1. Ross's argument is with DCF, as typically applied, and is not inconsistent with the concept of there being an opportunity cost of capital. 2. That Storr's language indicates that he is probably being more theoretically sound that Ross seems to think. 3. Lastly, that each experts ideas

[4]There is a related issue Ross is trying to get to: that the use of debt financing gives you some benefits, particularly reduced taxes, but at the cost of some financial flexibility --- and that you might think about valuing that lost flexibility with option pricing methods rather than (sic) considering the cost of reducing your bond rating to be the increased borrowing rate you will pay. But this issue is tangential enough to the basic point of the article that it should have been scrapped by the editor.

notwithstanding, the concept of cost of capital is crucially important because it underscores the basic fact that there are alternatives to using funds for this strategy and if the strategy doesn't beat the alternatives, it shouldn't be followed.

Ross's argument is with DCF as it is typically applied, not with cost of capital per se

Frequently DCF analysis of investments (projects, strategies and firms) ignores valuable options associated with the investment: e.g., abandonment options, flexibility options, expansion options, waiting options. It estimates future expected cash flows from the perspective of some status quo strategy (e.g., a capital intensive growth strategy or a low capex harvesting type strategy). In the future cash flows, the investment requirements to maintain the strategy are treated as if these investments will be made regardless of what happens in the future. That is, as typically applied, DCF ignores important contingencies in future cash flows. Last, but not least, DCF as typically appliled, assumes that there is one discount rate, the cost of capital, which should be employed to calculate the present value of a strategy's cash flows.[5]

Decisions made at future dates depending on the underlying value of the investment (and perhaps other random variables) such as abandonment options, future investments, etc., can be valued, in theory, in a more elaborate contingent claims framework (real asset options framework). This is done in many instances, and is a very useful way to think about

[5]The analyst may incorporate the term structure of interest rates into the discount rates, giving a different discount rate for each cash flow, but the risk adjustment will usually be the same across time. Even if the analyst models the risk of the project as changing over time, it usually simply models risk and required returns as a function of time, rather than as a function of the value of some underlying asset, as it implicitly would be in a contingent claims framework.

investment decisions in general. In the TiO2 case, we discussed the importance of flexibility options, waiting options and abandonment options.

If we were careful to construct a decision tree for each future date and decision node, we could presumably calculate a "corrected" set of future cash flows, which incorporate the expected

value of all the contingent claims imbedded in the investment. Here's where you get to Ross's point about the cost of capital: the appropriate discount rate to discount expected cash flows from "option-like" payoffs is not a constant through the life of the investment, as is typically assumed in DCF analysis. The expected return, systematic risk, etc., of an option is a relatively complicated function of the value of the underlying asset (as well as other terms of the option, volatility, and, perhaps, other random variables). But notice, this is not to say that there is no cost of capital, that there is no alternative investment with similar risks and similar potential (possibly contingent) payoffs, just that it's not simple to calculate it and it may not be the WACC we've calculated for the investment.

Ross says clearly that, while there are qualitative considerations in strategic decisions (referring to the General Foods acquisition by Philip Morris), "...that doesn't mean you throw good financial sense out the window. You always have to ask: Is this the right price, or the wrong price." He is saying that if investors could put that money and earn competitive returns (on securities with the same contingent cash flows and risks) higher than those earned by the investment, the investment should not be done.

Also, when Ross asks Storr whether a division requesting funds for an investment gets charged for the use of capital, and Storr says no, Ross responds with "You allow the person

making this decision, in effect, to think the capital is free?" When Storr defends himself but still doesn't address the issue, Ross counters yet again with "But how do you compare up-front cost with going-forward cash flow if you don't use something like an interest charge to capital?"

At some point later, the moderator asks Ross "... Steve, it sounds as if you think Hans should be paying more attention to cost of capital," which, of course, he is, because when you make any investment you have to ask what else could be done with the funds, both within the business and by your shareholders (it is, after all, their money). Ross states again that he is not so sympathetic to using cost of capital, but that Storr always puts a strategic posture on his answers instead of looking at the economics and asking whether it is a good decision. Good economics says to look at the opportunity cost, Ross believes that a more generalized valuation framework will give us a better measure of opportunity cost and value in that it will appropriately value the strategic considerations associated with the investment. But it is still an opportunity cost and is not inconsistent with the notion of cost of capital.

Is Storr applying sound financial principles?

This is a hard call. In the quote on page two he suggests that he thought more of the strategic value of the acquisition than its NPV per se. But he says he did consider the multiple they would have to pay and whether they could raise this money at reasonable enough rates. This question seems to be a "what will it take and can I do it?" philosophy more so than a "at this price, is it something I should do?" philosophy, but he may already *know* it's a good deal and now it's a question of getting it done.

Later, he says cost of capital is not used on a day-to-day basis ... they have a capex

budget that is used for maintenance and growth, these expenditures are incorporated into the cash flow forecasts and are "...driven by capacity needs. In a day-to-day environment where we already know the profit margins of the business, we don't really pull back and look at the cost of capital, but we do a return on investment and payback analysis." This is not surprising: most of the capex here is already in the plan. The decision about making these investments was made earlier when you decided what businesses to be in, what strategies to follow in each business, etc. Of course, they could revisit these issues continuously and say, should we abandon, change strategy, etc., but the answers to these questions may, at this point, be obvious. The real question is when they decided on strategy, did they incorporate some notion of a cost of capital or did they make all these decisions by gut feel.

They do follow up monitoring of investments on an cash flow ROI and payback basis, and you could argue here that they could do a better job with EVA or some measure incorporating cost of capital, but it would be moot.

Later Storr points out that when analyzing projects they use projected cash flows and calculate IRR's of those investments. He states, very reasonably, that in emerging markets the financial assumptions of your cash flow model are so fragile that the discount rate is not that important in the end. He also argues that for strategic investments such as building a tobacco manufacturing plant in Eastern Europe or a coffee processing plant in China, these investments are huge and the IRR they calculate may be below their cost of capital, but they may decide to do it anyway, *presumably for strategic reasons.*

Ross has the opportunity at this point in the article to make the bridge between their positions, but instead asks "Do you assume the cost of equity is not affected by the amount of

borrowing you do?" If you asked, "Where did that come from?", good, so did I. He proceeded to systematically move towards making a point that Philip Morris doesn't have enough debt in its capital structure. He may be right, with Philip Morris's EBIT/Interest coverage at about 7-8 and $15 billion in debt to $75 billion in market equity as of fiscal year end 1995. But this was a different issue, really unrelated to the discussion thus far, and seemed to be an ulterior motive of the article rather than shedding light on the cost of capital issue.[6]

The crux of the issue is whether they are *seemingly* making negative NPV investments, but which have *positive* NPV after you have estimated their strategic value, or whether they are making negative NPV investments at the shareholders' expense because they have overvalued strategic considerations. I'm not going to take a stand on which goes on in general or at Philip Morris. But it does lead to my conclusion.

The concept of a cost of capital is crucial in evaluating investment decisions

It doesn't have to be a single risk-adjusted discount rate (like a project WACC), but anytime corporate officers are making investment decisions, acquisition decisions, divestiture decisions, joint venture decisions, etc., they should consider alternatives that are available to their investors. If it is all their own money on the line, then who cares if they make negative NPV decisions? It is not usually their money. Philip Morris's capitalization (debt and equity) is around $90 billion; there are a lot of investor dollars at stake. To ignore the fact that this is

[6]It also seems to be a hot button for S.L. Mintz, the moderator of the discussion, based on several of his earlier articles.

someone else's money and they could put these funds elsewhere is not only using bad financial principles, it is bad management.

Like Steve Ross, if we can appropriately model the strategic options imbedded in an investment strategy and better answer the question "What is the right price?", we should. This would lead to strategic decisions being made more with the brain and less with the gut. Not everyone would agree that the "if" condition holds at this point. But that's a different story.