

## Real-Options Valuations: Taking Out the Rocket Science |

By Martha Amram and Keith M. Howe

We clearly live in a world of financial extremes, and the pendulum has now swung back. Public accountants are signing off on corporate books with near paralyzing conservatism; financial analysts are screaming “transparency” at the companies they follow; and the mantra of the day among the government and corporate leaders is “fix corporate governance.”

It might seem that the tense financial mood would make real options irrelevant and useless, but, in fact, interest in the valuation and strategy technique remains strong. Yet without some changes, managerial patience with the complexity of a typical real-options calculation may rapidly wear thin. Too often, real options seems to need rocket science. Managers appropriately ask, “Why should we learn differential calculus?”

In this column, we tackle the computational complexity by first demonstrating when and why the real-options approach may actually be the most straightforward and then laying out some simple guidelines to maintain transparency in real-options calculations.

### Why Real Options?

The two most common options used in corporations are

growth options and abandonment options. For both, the option value is determined by an opportunity to make a decision: “If things go well, then we’ll make the next investment,” or “if things go poorly, then we’ll kill the project.” The if-then statements reflect the contingent decision embedded in the real option.

Contingent decisions are present in nearly every growth opportunity. While there is a tendency to fall back on the “tried and true” valuation techniques such as payback, return on capital, and discounted cash flow, none of them

can correctly value a growth opportunity. They all significantly undervalue the opportunity to make a decision in the future and thus lead to an investment strategy that is too conservative and too cautious. Today it may seem prudent to save dollars and stay lean, but very quickly the mandate from the financial markets will change to “show

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### More Than the Number

If valuation were simply the process of producing a number, more companies would have adopted real options and a host of other innovative valuation techniques. In a recent book, *Value Sweep*, Martha Amram (a co-author of this column) argues that the social life of the number matters—our business/social community influences how the valuation result is shaped, transmitted, and used.<sup>1</sup> A successful valuation result is more than a number; it helps to "connect the dots" for the different players who need to buy into or agree to the growth project.

Valuation of growth projects often fails to articulate the imbedded contingent decisions, leaving managers skeptical of the valuation results. Without alignment of the valuation framework and how managers think they're going to run their project, the valuation result lacks credibility. Further, when finance staff enter the discussion by forcing a complex growth project into a strait-jacket of well-understood financial techniques—regardless if those techniques are appropriate for the project at hand—the valuation result is further distanced from credibility.

We argue for a two-fold change in perspective. First, recognize when and where real options should be used—when it is the appropriate tool. (See our column in the December 2002 issue for more detail.) Second, we propose five simple steps to remove the density of real-options

Table 1

### Five Rules for Successful Real-Options Calculations

- 1) Define and Value the Mature Business Model
- 2) Don't Get Creative
- 3) Tell the Story
- 4) Do One-Page Calculations
- 5) Think One Map of Value

calculations. Transparency is not an option in valuations; transparency is a mandate. Finance staff must make the analysis clear to the other functions. No one is willing to rely on rocket science.

### Successful Real-Options Calculations

Table 1 shows some simple guidelines for getting real-options calculations focused. Before we walk through each, let's pause for a quick perspective. Notice the absence of techno-jargon in the Table. Notice that none of our guidelines focuses on the details of the calculation method. That's because, in our experience, real-options calculations most often fail at a basic level—everyone is way too confused to want to understand the calculation detail. The success of a real-options calculation depends on getting the big picture right: Who is going to use the results? Why? How should the results compare to the value of other assets? Do they?

**Define and Value the Mature Business Model.** One of our memories of the dot-com era is the large number of start-ups that had no clue as to what they would be when they grew up. There is now an impatience with that level of ignorance, and rightly so. Further, growth projects

are like children and teenagers—it's impossible to put a value on them without being able to articulate and value the adult version.

For example, *Value Sweep* profiles a new biodegradable plastic, one that must fit into defined product markets. The new product opportunity can be valued by first looking at the value of the mature business. In the dot-com era, many public Internet companies—such as Webvan—did not have a clear model of how to make money when they finished their rapid, youthful growth. Real options may be the right valuation tool for growth opportunities, but real-options results are nonsense unless there is a quantifiable and valuable mature business model.

**Don't Get Creative.** Your project isn't that special. It won't defy the laws of economics, and it will fall into a well-known business model. With appropriate real-options models, that state of finance is actually pretty good at valuing known business models and the growth options based on them. We even know how to discount options and mature business models for lack of resources and failure to execute. So don't get creative—get realistic.

**Tell the Story.** In most companies, junior staff analysts will do a project

analysis by creating 50 spreadsheet runs, each confusing and ad hoc. But imagine an alternative: The finance types arrive at the critical project review meeting with a simple and compelling story of value growth (a narrative) and numbers to back it up. People respond and remember stories. Capture their imagination and gain an audience for your numbers.

A good logic check on the growth opportunity story line comes from completing two sentences: "The path to sustainable growth is ..." and "A pessimist would say ..." For example, for a new product, the project champion might argue: "The path to sustainable growth is to build four manufacturing plants, bringing each online only after a sales increase." A pessimist might argue: "Sales for this type of product are notoriously volatile. We could easily end up with two underutilized plants as well as huge expenditures for a third that is in the midst of construction." The two descriptions bring together the upside and risks to the investment, fostering consistency between the business plan and the valuation. Seeing both descriptions on the same page helps users of the valuation results better understand the risks of and the requirements for project success.

Here's how one experienced manager establishes the compelling value story, as described in *Value Sweep*. Geoff Moore, author of *Crossing the Chasm*, *Inside the Tornado*, and other books, is now affiliated with a venture capital firm. Moore has a Ph.D. in English, so it isn't surprising that he screens start-up business plans by their plot development. He treats a business plan like a novel: How

might the plot unfold to a successful outcome? Which side character (business partners or technology) must move first? How does the central character (the company) move to center stage? Moore argues that a complete plot line is part of a good business plan.

**Do One-Page Calculations.** The structure of value in growth projects is often opaque to senior management. Doing a gazillion different spreadsheet runs based on DCF will only further annoy top executives. Unless there's a change, the finance staff is in great danger of being shut out of the strategic decision process. The alternative is to use real options but keeping the analysis focused on the storyline, extremely simple and very transparent. *Value Sweep* demonstrates how to get growth project calculations onto one page.

**Think One Map of Value.** Currently, growth projects are valued in silos—from a company perspective without reference to how the financial markets are pricing similar opportunities. Real options has the powerful potential to transparently link the value of private assets to market values. This connection opens the door to growth: A strong

link aligns strategy and value; a transparent link spurs outside financing to growth opportunities; a rational yet easy-to-use-framework speeds the negotiations for private assets. Most important, transparent alignment with market values makes comparisons across growth opportunities clear.

Look for comparables in the financial markets. Look for areas in which the financial markets have updated valuations similar to that of your project. We read the stock market when picking stocks to invest in, so why aren't we reading the market to pick growth projects? Real options can help.

As in our December column, we remain optimistic about real options. Even under the stress of our times it provides a clear and rational way to value growth opportunities. The challenge is now about communication. And, ironically, we argue that a very sophisticated tool—one that won its creators the Nobel Prize—needs only a strong story and a short set of calculations.

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<sup>1</sup> Martha Amram, *Value Sweep: Mapping Corporate Growth Opportunities*, HBS Press, 2002. Also see [www.valuesweep.com](http://www.valuesweep.com).

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