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Beyond puts and calls: Option pricing as a powerful tool in decision-making

by Glenn S. Daily

Option pricing theory is a major accomplishment of modern finance. By looking at the cost or reward of making a financial decision, it spurred development and widespread use of familiar financial options, such as puts and calls on common stocks, plus exotic derivatives. A key insight is that options could be viewed as a combination of an underlying asset and a risk-free investment. From the no-arbitrage principle, the price of an option is simply the value of the mimicking portfolio.

More recently, theorists have turned their attention to option pricing in the everyday financial decisions that individuals and businesses must make. Should you build a factory today, or wait to see what your competitors do? Should you default on your mortgage now, or wait to see if property values fall even farther? Should you be a leader or a follower in adopting new technology?

These decisions share three characteristics: 1) they are irreversible; 2) they can be postponed; and 3) their outcomes are uncertain. As Avinash K. Dixit and Robert S. Pindyck explain in *Investment under Uncertainty* (Princeton University Press, 1993), this combination thrusts the analysis of investment opportunities into the province of option pricing theory.

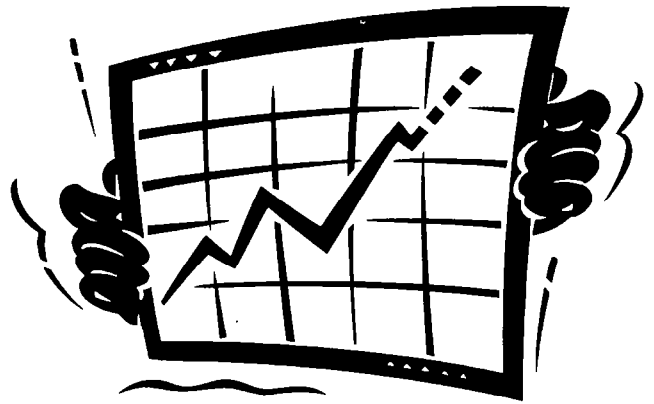
When a financial decision is irreversible, making a commitment today kills the option to wait until tomorrow. This option to wait is worth something, so you should factor its loss into your decision. People implicitly recognize this when they talk about wanting to keep their options open. By providing tools to quantify the value of the option to wait, option pricing theory gives people a more realistic framework for making decisions.

One example of this application is with buying and selling insurance. Consider lapse-supported life insurance products. There is a lively debate among actuaries about the merits of this pricing technique. Proponents argue that it rewards long-term policyholders, because of better persistency, better mortality (due to better persistency), and lower reserves and target surplus. That may be true, but lapse-supported pricing means low early cash values and that introduces irreversibility and the value of the option to wait.

To compensate the buyer for giving up the ability to reverse the buying decision and get money back, a lapse-supported product must offer better long-term values than a low-load product with high early cash values. How much better? It may take years for researchers to answer this, but published estimates for other decisions suggest that an option-aware consumer would probably find a lapse-supported product unattractive.

Indeed, it might be hard to justify the purchase of any product with low early cash values. In an option pricing framework, "buy term and invest the difference" becomes "buy term while you wait for the right time to buy a cash value policy." Taking into account the value of the option to wait, is it ever the right time to buy a low cash-value policy, or should you just keep renewing your term policy to age 100?

What can a company do to encourage purchase decisions? The short answer is



that it must find ways to reduce the buyer's perceived risk of regret, and therefore the value of the option to wait. Here are some suggestions:

- Make continued financial strength a clearly stated corporate goal. For example, announce that it is corporate policy to maintain financial strength ratings of AA or better from at least two rating agencies.
- Provide product enhancements to existing policyholders, even when a traditional cost analysis might say no.
- Levelize commissions to permit higher early cash values.

This insurance buy/sell approach is one application of option pricing as a non-traditional tool. Try this approach in other areas as well and see how it can help your decision-making.

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