CHANGE AND RISK MANAGEMENT: MANAGING TIME AND OPTIONS

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Many perceive change and uncertainty as a threat, and there is a natural tendency to resist threatening environments. But change and uncertainty also provide opportunities, and anticipating them enables managers to not just adjust but also profit from them. Managing risk for opportunity increasingly involves investment timing and options thinking.

MANAGING RISK THROUGH TIMING

In a decision environment characterized by risk and uncertainty, timing of decisions and management time are critical to effective decision-making. Timing is particularly important in decisions that involve technological innovations and market positioning. Most new innovations involve a high degree of risk in terms of the potential payoff, but the innovator or early adopter also typically has the highest potential to capture the most revenue or benefit from that innovation — when everyone else is doing it, the incremental benefits from the new technology are marginalized. Adopting new technology early usually results in higher returns but also higher risk if the technology is inefficient or ineffective. Later adoption has lower risk, but the payoff is typically small.

Likewise, in market positioning there is typically a first-mover advantage whereby the first to enter a market can establish a position that is difficult for competitors that follow to overcome. A quick follower may not lose a lot to a first-mover in market share and market positioning, but a late entrant typically can only grow volume and gain market share by offering superior products and services (which usually costs more and thus has lower margins), or by price-cutting to "buy" market share, which also pressures margins. Again, timing is important in market positioning with the advantage being captured by those who enter or move early compared to those who delay.

But, being the first mover is not always best. There is also a phenomenon known as the follower's advantage — the benefits that a second mover can obtain by carefully monitoring the successes and failures of the early adopter or first mover and learning from those experiences. In fact, time and time delays can have real value. Many decisions, particularly major decisions involving the commitment of money and resources, can be made sequentially rather than all at once. Sequential decision-making can allow the early follower to learn from the first mover's mistakes without making the same commitments until the uncertainty of the situation subsides. Managing this sequencing process and taking advantage of time delays is critical to making risky decisions.

One effective way to manage time in a risky environment is to use time delays to gather additional information or to learn. Waiting for new information might allow the decision-maker to learn more about the odds or chances concerning the risky events that might occur, giving the decision-maker more confidence about the potential outcomes of the decision. Delaying may also provide an opportunity to discover changes in the environment surrounding the decision problem, which alters the original probability distribution with some events becoming more likely and other events less likely, or to improve the accuracy of estimated consequences or payoffs. By delaying, the firm might also learn new ways of thinking about the decision problem, new ways of framing and specifying the problem, new events that should be recognized, new sources of cost and revenues that should be considered in estimating the payoffs, or new uncontrollable variables that might impact the odds or chances of a specific event. In essence, learning goes beyond obtaining new information because it may result in the identification and definition of a new decision problem rather than simply a more accurate specification of the current problem. Information and learning are important components of a risky decision that are embedded in the sequencing of investments.

OPTIONS THINKING

One way for a manager to explicitly account for the timing and sequencing of risky decisions is through options thinking. Options thinking provides the business manager the opportunity to think about "managing" risk to capture opportunities rather than avoiding risks. Options theory is widely used in financial markets to transfer and price interest rate, foreign exchange rate, commodity price, stock price and other risks. More recently, the concepts of options theory have been extended beyond the financial markets to investment and strategic decisions in an uncertain environment — real options.

The basic premise of real options theory is that many investments (as well as most strategic decisions) involve risk and uncertainty concerning future payoffs and costs, but the decision can often be divided into stages and sequenced so that more information is available after the first stage that will influence the probability as well as the potential size of the expected payoff. In these circumstances, the initial stage investment or commitment is much like buying a call or an option, i.e. the opportunity but not the obligation to make additional investments or commitments at a later stage.

Options thinking explicitly considers the benefits of delaying a decision or financial commitment in an uncertain environment. In essence, there are two financial benefits of any delay in committing funds. First is the interest or earnings received on those funds not committed but instead invested elsewhere while one waits. This benefit accrues no matter what happens to the risk or uncertainty during the delay. A second benefit of delaying is that, as suggested earlier, additional information can be gathered, or a more detailed analysis can be completed that will increase the certainty about the future costs and benefits that result from the decision or investment commitment.

Delaying has a benefit irrespective of what one finds out about the payoff — whether it is bigger or smaller than originally anticipated. And the more uncertainty there is about that payoff (whether negative or positive), the larger the value of the option to delay making the investment or decision. In essence, delaying a decision to have more certainty about either good or bad events in the future has value for two reasons: 1) to capture the benefits of completing the investment if they are higher than expected, and 2) maintaining the flexibility to avoid a mistake if the benefits are not as high as expected. Having the opportunity to obtain more accurate information about the future is valuable, even if that future is negative.

An options mindset is critical to successful management in changing times. Identifying and creating real options is one of the important skills of an options mindset. In fact, successful management in rapidly changing times may be more dependent on the creativity in designing, crafting and recognizing options as it is in the decision model to value and choose the correct strategy. Figure 1 lists four of the broad categories of real options to help you get started refining the skills to identify real options opportunities.

Two areas where options thinking has significant potential are in market development and information systems investment and deployment. With respect to market development, the logic of investing marketing resources to identify and sell to influencers can be most logically framed and analyzed as a real options decision where the high payoff potential is the incremental customers that the influencer impacts. Likewise, common marketing strategies, including bundling, customer lifetime selling, loyalty programs and cross-selling in the financial services market can be logically analyzed as real options problems or issues.

With respect to information systems and technology, a critical characteristic of information is that if it is not captured and cataloged when it appears or becomes available, it is frequently lost and not recoverable. Consequently, the payoff of gathering time-dimensioned information may not be readily apparent at the time of capture, but it may create opportunities, which would be unavailable without that historical information. Such examples as documentation and traceability systems in the production and distribution industry, or data sets that allow data mining and use of techniques such as statistical process control to understand determinants of performance and implement continuous process improvement systems, are examples where the current benefits may be limited, but the future opportunities created are substantial and can only be assessed with an options framework. Similar arguments apply to resource commitments to knowledge and learning activities (whether experiential, real-time learning or formalized training and education) where the current and direct benefits may be limited but the future opportunity set is expanded dramatically.

FIGURE 1 **CATEGORIES OF REAL OPTIONS**

Sequencing options — Consciously sequencing the investment over time to minimize current exposure but maintain the flexibility to capture future opportunities.

Delay options — Deliberate decisions to make smaller initial investments to maintain the right to make the larger investment when a specified feature event occurs.

Growth options — Prospects or possibilities for new markets, new products, new customers and new ventures that would not be open or available without the initial commitment of resources.

Contraction/exit options — The flexibility to reduce the commitment or divest of resources at high residual values or minimum costs if unexpected events should occur.

A FINAL COMMENT

The accelerating speed of change in the food and agribusiness industries is resulting in more risk and uncertainty — the future is becoming much less predictable. Not only is the future more uncertain, the drivers of that uncertainty are also changing. Strategic risk, which generally has a low probability of occurrence but large consequences, is becoming an increasingly important component of the decision environment. Effectively managing time to gather information and options thinking to create flexibility are two techniques that can be used to manage the increasing risk and uncertainty in the agricultural sector. **AM**

Note: *On Aug. 30-Sept. 1, 2005, mid-level and senior agribusiness managers will join Purdue and Columbia University experts in seminar. They'll use options thinking to create flexibility in managing the risk and uncertainty associated with decisions such as those mentioned. For more information on development of this topic, contact Sharon Wall at Purdue's Center for Food and Agricultural Business, e-mail: swall@purdue.edu, or phone: 765/494-4247.*