

Putting the Risk Scorecard to Work for Your Seed Company

Part III in Series on Risk Management

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Previous risk management articles discussed the taxonomy of risks faced by agribusinesses, a method for categorizing and assessing these risks via a scorecard, and how a firm should determine which risks are the most threatening to its financial well-being. Here we will present real options for managing strategic business risks.

In the last article in this series, ABC Seeds Inc. conducted a risk scorecard analysis. One of its principal strategic risks was the allocation of financial resources to commercialize a new seed variety. Since then, ABC Seeds has conducted a financial analysis of the development and commercialization of the new variety. The traditional financial analysis resulted in a net present value (NPV) of -\$1 million. Normally, this would suggest that ABC Seeds should abandon the project. But management realizes that there is both an upside and a downside to the investment. On the upside, if the regulatory approvals are won and the market materializes, the product may produce up to \$15 million in profits. On the other hand, if regulatory approval is not met or the market doesn't materialize then a substantial amount of the original \$20 million investment could be lost. Yet, what happens if the company does not invest in the new seed variety and a competitor develops it and takes away current customers. These uncertainties all must be considered before ABC Seeds walks away from the investment. Real options might be useful in helping ABC Seeds address this decision.

Real options are a direct extension of financial options, but focus on physical or real assets instead of financial derivatives. Real options explicitly consider the benefits that additional information will have on the true value of a decision or investment. A real options framework is appropriate for situations where the ability of the manager to make operational decisions throughout time affects the value of the strategic choice. This occurs because flexibility is involved in the decision

(e.g. defer, abandon, or expand a given project). But flexibility is only valuable if managers are allowed to incorporate the new information into their decisions over time. Thus, real options are a learning model that allows management to make informed and accurate strategic decisions over the course of time.

In our simplified example, ABC management believes that the new seed variety has approximately a 35% chance of meeting regulatory approval. This is purely a conjecture and management understands that many of the uncertainties surrounding the profits from the new seed will be resolved over time. Management could make a smaller \$2 million incremental investments in R&D test plot activities for the new variety; a fraction of the total cost of full commercialization. This incremental investment would maintain the option of making additional investments to commercialize the seed in the future after its regulatory status is determined. By accounting for the uncertainty in the regulatory approval process, the option value of waiting to launch the new seed can be computed.

A straightforward approach to calculating the option value of waiting is to take the difference between the expected NPV of waiting to invest and the expected NPV of investing now. In ABC Seeds' case, the option value is \$3 million. The option value to wait indicates that it is worth making the incremental investment in R&D today to maintain the option to commercialize in the future since the value of the option is greater than the initial NPV.

Why do we get a positive expected NPV by making the incremental investment? By delaying the total investment and only making the incremental investment in R&D activity, we place a limit on the company's investment exposure while maintaining the upside potential of the project. This is because during the delay period, information is revealed about uncertainties in the launch of the new product. For example, ABC Seeds might discover that a

previously unforeseen problem with the seed is going to result in likely rejection from the regulators. By having this information revealed, ABC Seeds can choose to avoid additional investments for commercialization and lose no more than the incremental investment. Alternatively, it might find during the delay period that their seed is highly effective at preventing a particular disease; improving chances of regulatory approval and market acceptance. This new information, combined with the incremental investment in R&D, allows ABC Seeds to still have the option of commercializing the new variety within the next year and preempting a competitor from reaching the market first.

Companies that want to remain competitive in their industries must effectively manage their risks. To do this, they must first identify the taxonomy of risks that their firm faces, and then use the risk scorecard to assess these risks and develop strategies to exploit potential opportunities and reduce exposures. The real options approach recognizes both the exposure and potential of a risk. Through the explicit use of incremental investments, current information, and managerial flexibility, a company has the ability to minimize the exposure of a risk without forsaking its potential. Decision-makers who incorporate the risk management strategies presented in this series will find that their companies will be more effective at managing uncertainty. 

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