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Insuring the Portfolio Against Large Project Failure

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Preview

Summary

There is a growing body of literature in our industry that addresses the use of portfolio-management techniques to find “optimum” mixes of projects that meet company goals while managing risk. These investigations usually start by describing “risk” in some manner, then proceed to illustrate how combinations of properties can be chosen that minimize this risk function subject to the other goals of the company. The probabilities of meeting individual metric targets in discrete time frames also can and should be quantified.

This type of analysis is valid and useful, and it forms the backbone of project portfolio management. However, when dealing with risk and probability concepts, it is easy to lose sight of the fact that specific events will occur in time and that the portfolio must include enough flexibility to allow reaction to and recovery from these events.

Specifically, acceptable portfolio results may depend on a small number of projects performing at a certain level. Because the chance of these important projects not performing at this level may be relatively small, the risk is deemed “acceptable.” If one of the projects subsequently fails to perform, what was once “acceptable risk” can become an exercise in salvaging a year or even saving a company.

This paper shows how portfolio-management techniques can be used to plan a portfolio robust enough to recover from the potential failure of a significant project. These techniques can lead us to make investment choices today that might not be obvious if projects are evaluated solely with their expected values; those choices, if made judiciously, can provide insurance against a possible future downside.

Portfolio analysis is a powerful technique, with applications far beyond the standard risk/reward exercise. The examples presented demonstrate how this analysis can be used to provide insight into the practical business questions that truly concern company management.

Introduction

Most strategic planning and investment analyses use the concept of expected value to consolidate results and understand them in aggregate. Expected value is a powerful concept, but it can lead the analyst astray if not used judiciously. We refer specifically to instances in which an unlikely negative outcome is obscured in an expected value context but, should it occur, would significantly harm the company’s performance. In

this paper, we will show how a portfolio-management model, when used in an investigative manner, can be used to reduce the potential downside in these types of situations.

We start by defining the terms contained in the title of this paper:

- “Large Project”—a project whose failure would make it highly unlikely that the company would meet its stated goals; this shortfall would be significant.
- “Insurance”—a relatively small payment made to avoid a potentially much larger, but less likely, cost in the future. In the context of portfolio management, insurance means finding a portfolio of projects that has a somewhat lower net present value (NPV) or other metric value than some optimum, but which is much less sensitive to a potential negative occurrence.
- “Portfolio”—“Portfolio management” is a popular term in oil and gas economic evaluation at present, and it has been given a variety of definitions. Some use it to describe virtually any method used to compare the relative attractiveness of investments, while others consider that any variation from the “portfolio selection” work of Markowitz (1997) invalidates a portfolio-management procedure. Our definition falls between these extremes and will be detailed in the next section.

We look at two examples of using portfolio-management techniques to arrive at alternate portfolios that are better suited to absorb a particular event than a simple optimization might suggest. The first example considers the failure, during the coming year, of a very large exploration prospect. This project is large enough in relation to the other prospects that the expected value of its reserves forms a significant part of the portfolio reserves additions for the 2 subsequent years. Its failure requires an immediate reshuffling of the portfolio. In this case, the insurance will entail identifying those options that need to be kept live and that need to be continued to predrilling investment, even though they were not a part of the initially selected portfolio. The second example looks at the possible loss of a division 2 years in the future. Portfolio analysis is used to find an alternate to the optimum portfolio that allows acceptable performance should this event occur and still meets all the company’s initial targets if it does not occur. “Insurance” here consists of a modified investment program with a slightly lower NPV.