

ABSTRACT

The Impact of Dependency Analysis on Prospect Ranking and Portfolio Evaluation: A Case Study in Offshore Brazil

Rafael Lima, M.Sc. in Energy and Earth Resources

In general, prospects belonging to the same basin or play tend to have geological similarities so that the first results may affect chances of success in remaining opportunities. For example, when confirming the presence of porous reservoir in a stratigraphic objective of a particular well, we can expect an increase in the geological chances of another prospect with similar seismic facies, consequently increasing its expected value and the value of the remaining portfolio. After analyzing public geological data and volumetric estimates in the Foz do Amazonas Basin, in addition to the results of one of the bid rounds offered by the Brazilian government, the author developed a model to quantify changes in the value of an exploratory portfolio when considering possible relationships of dependence and synergy between prospects. When testing a fictitious portfolio of thirteen prospects with different dependency relationships through a Monte Carlo routine, an increase of about 30% in net present value was observed, compared to a portfolio of independent opportunities. Moreover, when considering dependence between prospects, we obtained better success rates and a more efficient use of available resources in all four different ranking methods tested, thus highlighting the importance of this approach to a more accurate portfolio evaluation and informed business decisions.



Advisor: William L. Fisher