

An Analysis and Comparison of Real Option Approaches for the Petroleum Investment

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In many instances, oil companies struggle with decisions pertaining to petroleum investment. The difficulty partially stems from the uncertainties in many of the inherent variables. As commonly acknowledged, traditional valuation methods are unable to properly portray investment opportunities. Due to large uncertainty in Petroleum Exploration and Production (E & P), investors are gradually turning to a more dynamic approach to investment decisions.

Real Options Valuation involves a methodology for evaluating the value of an opportunity, leading to a strategic decision in an uncertain environment. Based on academic research in finance and business management, Real Options Valuation may be extended from option-pricing tools of the finance sector to that of evaluating E & P projects. However, although Real Options thinking has been widely accepted and used in some cases, the wider use of the Real Options approach is still a “hot” debate in the petroleum industry.

A permissible definition of “Real Options” may lead to inconsistencies among Real Options approaches. The opportunity may involve technical aspects or may be purely commercial in nature. In all cases a quantitative approach is required. In the work by Borison (2003) and Bratvold et al (2005), the authors have listed five Real Option methodologies: the Classic approach, the Subjective approach, the Market Disclaimer approach (MAD), the Smith approach, and the Luenberger approach. A comparative analysis of these Real Option approaches is presented in this paper.

In comparing the above-mentioned Real Options approaches, two petroleum cases are considered. The technical uncertainty dominated case is related to reservoir management. The market uncertainty dominated case involves a Liquid Petroleum Gas (LPG) distribution project. The case studies presented the functionality of the five Real Options approaches. The research suggests that the petroleum industry could benefit from using Real Options Valuation in their investment strategy, thus improving petroleum business performance.