

Implementing a Real Option Model for Valuing an Undeveloped Oil Field

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Abstract

We present a no arbitrage model for evaluating an undeveloped oil field and its numerical solution and implementation. The model assumes stochastic, but mean reverting, risk adjusted oil spot prices, and includes a timing investment option. The results of using this real options model for evaluating a case study of an undeveloped oil field show that a significant fraction of the oil field value may be provided by the flexibility of delaying development investment, and that this flexibility value decreases as oil price increases. Also the critical price for developing decreases with the available time to develop. We illustrate the use that practitioners could make of the real option methodology to value oil contingent reserves by presenting a user friendly computer program with graphical interface. This implementation could help petroleum companies to use this sophisticated valuation approach that could otherwise be of little practical relevance.

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