

Optimal Switching Strategy between Oil and Gas Resource for Independent E&P Companies under the Price Risk

Eunchun Park (Korea University)
Hojeong Park (Korea University)
Hyunjae Doh (Korea Energy Economics Institute)

Abstract

Since the global oil crisis starting from the mid 2000s, oil and gas prices have been more volatile than other commodity prices. Under this circumstance, it is increasingly important to diversify oil and gas reserves from the perspective of Independent E&P companies that have relatively small production capacity.

This paper presents a real option method for analyzing the production behavior of the Independent E&P companies in the presence of uncertain revenues and irreversible costs that come from product choice between oil and gas. The paper identifies optimal level of differential price of oil and gas by employing real option model. However, Equations that determine the optimal thresholds are very nonlinear in the thresholds, so that this paper used numerical analysis to estimate optimal threshold points for switching product. The results are shown that in the range of differential prices between the two thresholds, the optimal production behavior is to continue with the status quo, whether it be switching product. The thresholds are largely determined by volatility of differential price, and the gap between two thresholds become larger with the volatility of price increases. This paper also provides sensitivity analysis with other variables in terms of changes on threshold points.

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