Abstract

There are many kinds of Investment, for example is an investment in real assets, to be exact like investing in a petroleum project. The value of investment or the total budget could be estimated by using Binomial Lattice approach. Option value estimation used the price of crude oil in the market (S_0) as its first input. Then from those data, some necessary parameter will be determined, and used in estimating the price of Undeveloped Project (V). Undeveloped Project here is value of this petroleum project which has not been executed. In this research, by using the value of undeveloped project, we will be able to estimate the value of Exercise Boundary at all time. It was intended to give an advice for investor to consider whether to continue to the exploitation step, or not. An experiment was done by inputting a certain value, then comparing the value of the undeveloped project. The option value from Binomial model has similarity with the result given by Crank-Nicolson's model when the market's price reach 121.60773 USD/Barrel, which in the amount of 36.608 USD/Barrel. The result of the Binomial model did not give significant impact on parameter t. For any number of t, Binomial model keep giving the same result, when market reach 121.60773 USD/Barrel. For a few number of times of experiments, by changing the value of the parameter, it was discovered that the bigger the value of volatility (σ), the bigger the value of exercise boundary. Whereas the bigger the free risk interest rate (r), the value of exercise boundary is getting smaller while on the other hand bigger the value of subintervals (N) that was given will make the range of value in exercise boundary smaller. From the whole estimation it was discovered that the closer it is to the maturity time, the smaller the value of undeveloped project, with an average execution time of experiments for 1000 subinterval 1.2 seconds and 244.9 seconds for 6000 subinterval.

Keywords: investment, real option, petroleum projects, finance, undeveloped project, binomial.