Abstract

The example of real assets investment is funding investment in petroleum project. The amount of the cost that will be invested is calculated by Black-Scholes approaches. This approaches is usually used for the calculation of option prices in financial investment. The real options calculation will be tested with Black-Scholes approaches. The calculation of this options will be solved numerically by finite difference using Forward in Time Center in Space (FTCS), Backward in Time Center in Space (BTCS), dan Crank-Nicolson methods. Crude oil price in the market (V) as an initial input, then from V data several parameters that required in the calculation will be determined and will be used for undeveloped project (F) calculation and waiting value calculation.

In this research performed a few times of testing by changing the parameter values, in order to see the sensitivity of undeveloped project price against to the changes of parameters values. For the market price volatility parameter (σ) and the expected return parameter (μ) if the greater value is given, the undeveloped project price will be increased. While for the investment amount parameter (D) if the greater value is given, the undeveloped project price will be decreased. Related to the error analysis, for the partition size 6000 using FTCS method is unstable because it doesn't satisfy the stability of error requirement, while for BTCS and Crank-Nicolson methods satisfy the stability of error requirement. From the test result, if the time is approaching to the maturity, the undeveloped project price will be decreased.

Keywords : investment, real options, petroleum project, Black-Scholes, finite difference, finance