

Real Options Used in Projects of Industrial Unit Divided in Independent Subdivisions

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Abstract / Resumo:

The goal of this work is to present: the economic risk factors of a specific project identified as relevant in analyzing the probabilistic distribution of its net present value (NPV); the stochastic process used to simulate each of these factors; the necessary data for modeling cash flow identified in the analysis of budget demonstrations and the probabilistic distribution of net present value (NPV) using the real-option methodology to postpone investment.

The project refers to a plant that has oil and natural gas as its main raw materials and produces petroleum derived products.

The project, which is about building an industrial unit, was divided in five independent subdivisions or modules with specific raw materials and products, different operation start dates and independent NPV.

The use of real-option methodology will allow a distribution of NPV for each of those units, taking into account the added value from the option to postpone investment. With this data, we can find a great time combination to establish the beginning of each unit's operation in which we have the maximized NPV of the whole project.

The risk factor that impacts so much the NPV of a lot of projects is the investment. Besides the study of the most appropriate stochastic process to model it, we generate a lot of scenarios to variation of this investment in oil industry.

Keywords: stochastic process; mean reversion movement; real options; Monte Carlo simulation; projects analysis