Chapter 2
Oil and Gas Forecast

ABSTRACT

Initial Oil and Gas Forecast Model With Uncertainty makes forecasts of production-revenues-expenses for a multi-year period in the face of much uncertainty. It creates forecasts for 10 years, with all of the input required. The NPV of about $10.4 million is a best guess, but with all the uncertainty that exists. Oil and Gas Forecast Basic @RISK Model introduces essential improvements. Each of the input cells is modeled with a specific probability distribution. The values are generated once and then used each year. The decline in oil and gas production is constant from year to year. The model assumes constant trends in oil and gas prices. The annual operating expenses vary around 3% of the initial capital expenditure plus $3 per barrel of oil. Oil and Gas Forecast Sensitivity Analysis considers the uncertain inputs the NPV output is most sensitive to, illustrating one of the options in @RISK sensitivity analysis.

INTRODUCTION

Oil and Gas Forecast

The decline curve is a method for estimating reserves and predicting the rate of oil or gas production. It typically shows the pace at which production is expected to decline over the lifetime of an energy asset.

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- The decline curve is a method for estimating reserves and predicting the rate of oil or gas production.
- The decline curve is a method used to determine the estimated ultimate recovery (EUR) for an oil or gas reserve.
- Primarily based on good conditions, three types of decline curves can apply to the future trend: exponential, hyperbolic, and harmonic.

Knowing the decline curve can help a producer estimate the number of oil reserves that can come from a well over its lifetime, the present and future value of a well, and the rate at which assets should depreciate on a company's books. In aggregate, the decline curve can also help determine the rate of production for a total reservoir or even multiple reservoirs.

The decline curve is a method used to determine the estimated ultimate recovery (EUR) for an oil or gas reserve. This calculation rests on a set of equations that U.S. geologist J.J. Arps developed in 1945. It is of the utmost importance that drilling projects meet an acceptable EUR threshold for a project to be considered viable and profitable.

In theory, the decline curve can apply to most wells in the industry. Underlying the decline curve equations is an expectation that well-production typically follows a three-part pattern.

1. In the initial phase production phase, the flow of oil or gas remains relatively steady, as pressure stays nearly constant.
2. Next is a transient period in which the flow of oil or gas declines rapidly, as the quantity of recoverable assets and pressure in the wellbore decreases.
3. Lastly, assets deplete to a level at which they approach the well's defined boundaries.

Arps decline curve equations most often apply to the boundary-defined production phase.

Calculating the decline curve involves a curve-fitting exercise to interpolate the future rate of production based on past production levels. Therefore, a somewhat lengthy period of time-series data is needed to estimate the projected trend. Also, the decline-curve equations assume

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