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Graduate Certificate in Upstream Oil and Gas Operations Financing

# Financial Modeling and Decision Making in Oil and Gas

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Financial modeling is the process of creating a representation of a real-world financial situation in a spreadsheet. In the context of upstream oil and gas operations financing, financial modeling is used to evaluate the economic viability of oil and gas projects and to make informed decisions about investments and operations.

There are several key terms and vocabulary that are commonly used in financial modeling and decision making in oil and gas:

1. **Reserves:** The estimated quantities of oil and gas that can be recovered from known accumulations. Reserves are classified as proved, probable, or possible, based on the level of certainty associated with the estimate.
2. **Production:** The amount of oil and gas that is extracted from a reservoir over a period of time. Production is typically measured in barrels of oil equivalent (BOE) per day.
3. **Revenue:** The income that is generated from the sale of oil and gas. Revenue is typically calculated by multiplying the volume of production by the prevailing market price.
4. **Operating costs:** The costs that are incurred in order to extract and produce oil and gas. Operating costs include expenses such as drilling, completions, and production operations.
5. **Capital expenditures (CAPEX):** The costs that are incurred in order to develop a new oil or gas field. Capital expenditures include expenses such as drilling wells, constructing facilities, and acquiring leases.
6. **Operating cash flow:** The amount of cash that is generated from a project's operations, after accounting for all cash expenses. Operating cash flow is calculated by subtracting operating costs from revenue.
7. **Discount rate:** A rate of return that is used to calculate the present value of future cash flows. The discount rate reflects the risk associated with an investment and is used to determine whether an investment is worth making.
8. **Net present value (NPV):** The difference between the present value of a project's cash inflows and the present value of its cash outflows. A positive NPV indicates that a project is expected to generate more value than it costs to implement.
9. **Internal rate of return (IRR):** The discount rate at which the net present value of a project's cash flows is equal to zero. The IRR is a measure of a project's overall profitability and is used to compare different investment opportunities.
10. **Sensitivity analysis:** A technique for evaluating the impact of changes in key variables on a project's financial performance. Sensitivity analysis is used to identify the factors that have the greatest impact on a project's profitability and to assess the risk associated with an investment.

Financial modeling and decision making in oil and gas involves using these concepts to build a financial model that can be used to evaluate the economic viability of a project. The model typically includes a

detailed projection of the project's revenue, operating costs, capital expenditures, and cash flows over the life of the project.

For example, a financial model for an oil and gas development project might include the following steps:

1. Estimate the size of the oil and gas reserves that will be produced over the life of the project.
2. Estimate the production rate and the number of wells that will be needed to achieve the desired level of production.
3. Estimate the operating costs associated with drilling and producing the wells.
4. Estimate the capital expenditures that will be required to develop the project, including the cost of drilling wells, constructing facilities, and acquiring leases.
5. Calculate the revenue that will be generated from the sale of the oil and gas, based on the prevailing market price and the projected production rate.
6. Calculate the operating cash flow that will be generated from the project, after accounting for all cash expenses.
7. Calculate the net present value and internal rate of return of the project, using a discount rate that reflects the risk associated with the investment.
8. Perform a sensitivity analysis to identify the factors that have the greatest impact on the project's financial performance and to assess the risk associated with the investment.

By following these steps, financial modelers can create a detailed and accurate representation of an oil and gas development project, which can be used to make informed decisions about investments and operations.

In addition to financial modeling, decision making in oil and gas also involves understanding the broader market and industry trends that can impact the profitability of a project. For example, changes in global demand for oil and gas, geopolitical developments, and technological advancements can all have a significant impact on the financial performance of an oil and gas project.

To make informed decisions, it is important for financial modelers to stay up to date with these trends and to consider how they might impact the projects they are evaluating. This may involve monitoring industry news and reports, conducting research on market trends, and consulting with experts in the field.

In summary, financial modeling and decision making in oil and gas involves using a variety of concepts and techniques to evaluate the economic viability of oil and gas projects. Key terms and vocabulary in this field include reserves, production, revenue, operating costs, capital expenditures, operating cash flow, discount rate, net present value, internal rate of return, and sensitivity analysis. By using these concepts and techniques, financial modelers can create detailed and accurate financial models that can be used to make informed decisions about investments and operations in the upstream oil and gas sector. It is also important to stay up to date with broader market and industry trends in order to make well-informed decisions.