# AN ECONOMIC APPRAISAL OF THE CLAIR RIDGE PROJECT USING THE DISCOUNTED CASH FLOWS ANALYSIS AND REAL OPTIONS

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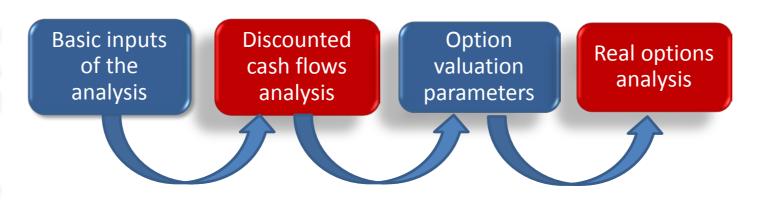


## **ABSTRACT & OBJECTIVES**

- This thesis examines the extent at which the discounted cash flows and real options analysis differentiate the basis for decision making in regard to the Clair Ridge project.
- ➤ Clair Ridge comprises the second phase of the Clair field development. The project constitutes of a huge capital investment and has the aim to exploit the excessive field's reserves for 40 years.
- ➤ However, the Clair Ridge project is characterized from risk and uncertainty deriving from the reservoir's structure and its long time horizon.
- ➤ On this framework, the main objectives of this dissertation are summarized as follows:
- The analysis of the two methodologies and the complexities in terms of applying them in risky projects.
- The interpretation and comparison of the results emerging from the analysis of Clair Ridge project with each method.
- The presentation of the main conclusions arising from the analysis.



# **METHODOLOGY**



# **Basic inputs of the analysis**

- Oil price and production rates
- Development, operating and decommissioning costs
- > Other inputs such as inflation, discount rate and tax regime

#### **Deterministic NPV model**

- Pre-tax net cash flows and post-tax net cash flows
- NPV, IRR, DROI and Payback period
- Sensitivity Analysis on oil price, inflation and discount rate
- Tornado diagram on oil price, total production, operating costs, development costs and decommissioning costs
- Monte Carlo simulation on oil price, production rates, operating costs and development costs

## **Option valuation parameters**

- Free cash flow ratios and project's volatility estimation
- Up and down factors (u and d), risk neutral probabilities

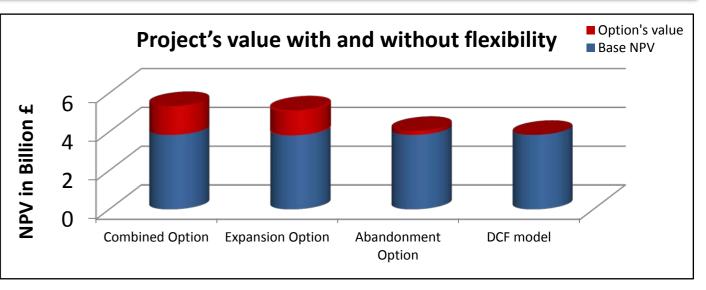
## **Real options analysis**

- Construction of the project's present value trees before and after paying dividends, with and without flexibility
- Determination of the project value after incorporating the option to abandon, to expand and their combination

### MAIN RESULTS

DCF Analysis				
NPV	IRR	DROI	Payback period	
£B 3,843	28%	0.93	7 years	

Real Options Analysis					
NPV	Option to abandon	Option to expand	Combined option		
Project	£B 4,047	£B 5,082	£B 5,697		
Option	£M 208.8	£B 1.238	£B 1.486		



# **CONCLUSIONS**

- ➤ The analysis results in a high level of project's profitability and a quick recovery of the capital investment.
- ➤ The oil price and production volume comprise the main determinants of the project.
- ➤ The incorporation of the option to abandon, to expand and the combined option can uplift the project's NPV by 5.3%, 32.2%, 36.3% respectively.
- ➤ There are significant signs for a further expansion of the project.