Strategic investment and asset optimisation in the LNG shipping industry: 
A framework for the real options analysis of vessel chartering arrangements under stochastic freight rates

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Explanation:
- The LNG shipping industry remains a highly undeveloped niche of the shipping industry, characterised by extremely high levels of capital investment and correspondingly high levels of risk aversion.
- This is at odds with the traditional buccaneering approaches taken in other sectors of the shipping industry which are well suited to the super-cyclical characteristics of the market.
- LNG ship owners regularly offer highly flexible chartering (leasing) arrangements to charterers without adequate compensation.
- This study suggests that this flexibility is of substantial value and ship-owners would benefit from its explicit valuation through the application of real options valuation techniques.
- To this end an intuitive valuation framework is established which is built upon the tools readily available to all market practitioners.

Option examined

Payoff to ship-owner at expiry = -max (S(t) - K, 0)
Payoff to charterer at expiry = max (S(t) - K, 0)

Monte Carlo simulation results scatter plot (charterer’s estimated ‘payoff’ at expiry)

Monte Carlo simulation results scatter plot (ship-owner’s estimated ‘payoff’ at expiry)

The framework:

Comprehensive summary of results

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Stochastic freight rates simulation without deterministic trend sample (20 iterations)

Stochastic freight rates simulation with deterministic trend sample (20 iterations)