

# Debt Capacity and Optionality in U.S. LNG Export Projects

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U.S. liquefied natural gas (LNG) export projects have more spot trading of LNG than traditional projects. Four key factors have facilitated this. First, the liquidity of the North American natural gas market and associated derivative markets provide an extensive ability to hedge price risks of U.S. LNG exports. Second, the lower investment costs of U.S. LNG export projects and their ability to source feed gas from a liquid market – rather than needing to incur large capital costs for upstream development – reduces the need for long-term sales contracts to underwrite debt financing. Third, portfolio traders have reduced the need for project developers to arrange their own long-term purchase and sale contracts with end-use customers. Fourth, U.S. LNG exporters do not face radically different transport costs to the major markets in Asia, Europe, and Latin America, which makes it less desirable to tie-up supply via long-term contracts with just one geographically advantaged customer.

U.S. projects also have two disadvantages compared to many competing LNG projects. First, transport costs to the largest LNG importers tend to be higher. Second, most competing projects are based on stranded gas resources that have a low, possibly even negative, opportunity cost. For U.S. projects, selling into the North American natural gas market provides an attractive, ever-present alternative to liquefying the natural gas.

We investigate these trade-offs by developing a stylized, but evidence-based, stochastic simulation model of a hypothetical U.S. LNG export project. We show how spot trading allows the U.S. projects to capture the value of many embedded real options. While the modal operating profits are insufficient to cover fixed costs, interest and taxes at usual leverage ratios, the mean real equity return is positive. This follows because the real option value of U.S. LNG export projects can be very high. In turn, this supports greater spot trading of LNG thereby facilitating arbitrage of natural gas prices across the globe. As such, expanded spot and short-term trades from U.S. LNG export terminals will accelerate recent changes to LNG markets.

Some researchers may find our approach to simulating world oil and gas price fluctuations of interest. To evaluate options, one needs a model that delivers probability distributions of possible outcomes. Our simulation allows prices to transition between dramatically different stochastic regimes.

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