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Using Little Big Data and Machine Learning to Manage Risk

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Abstract

In oil and gas, we drill anything but average well (outcomes can vary a lot). When it comes to Unconventional, there is plenty left in the ground (single-digit recovery factor). Therefore, it pays to explore machine learning to: 1) improve predictability of well performance, and 2) seek out the best refracking candidates. We illustrate with data examples of evaluating producing and undeveloped assets in practice, and refrac hunting in South Texas.

Tying it all together, we use the hybrid approach combining bottom-up well economics and top-down portfolio simulation to derive the intrinsic value-at-risk (VaR) and quantify portfolio performance by proximity to efficient frontier and risk-adjusted return. Our goal is to digitize prudent decision making, and develop intelligent assistant connecting strategy to execution that matches target risk-return preference with asset allocation.