

## **Chronic Exploration and Production Under-Performance: Is Dennis Horner's "Inevitable Disappointment" Portfolio Model Really Inevitable?**

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A troubling and persistent oil industry conundrum is that actual returns from E&P portfolios rarely seem to meet expectations. Since the 1980's, Dennis Horner's unpublished but widely circulated "Theory of Inevitable Disappointment" has been cited as demonstrating that actual performance of a portfolio of assets must inevitably turn out to be worse than predicted. The proposed paper belatedly puts Horner's theory into the literature, securing proper recognition for its originator, and also offers an alternative formulation, with different consequences.

Horner used "portfolio" in the narrow sense of a set of opportunities selected for implementation from a larger pool. If estimates were perfect, the performance of such a portfolio would exactly match predictions. His paper demonstrated that, since estimates are uncertain, a portfolio's overall performance will always fall short of ideal, even with unbiased estimation. By extending Horner's original concepts on uncertainty, the character of that "Inevitable Disappointment" can be shown to depend on how the uncertainty in estimates is formulated. Bias in estimation will also impact the extent of the "Inevitable Disappointment", by increasing the probability that underperforming opportunities may be selected and that attractive opportunities may be rejected.

Real industry data is compared with deductions from this analysis of Horner's hypothesis. Practical implications are discussed, including observations on how to improve the construction of broad oil industry portfolios, and on approaches to maximizing the value realized from a portfolio of opportunities after they have been selected.

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