

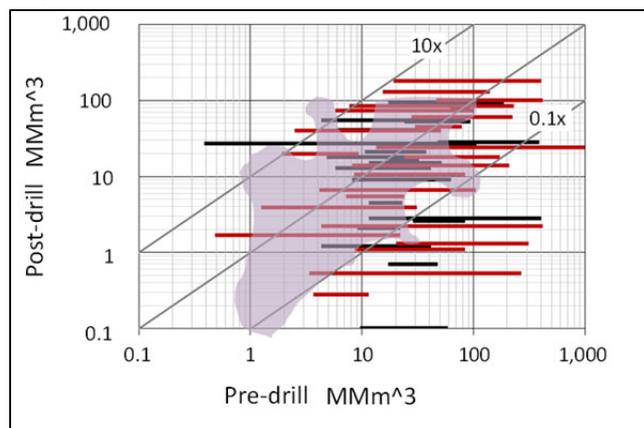
Performance Tracking: A Historical Background to Promote Learning

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Summary

This presentation provides a lookback on lookbacks, hopefully to spur further interest by companies in generating learning from exploration experience, rather than being victimized by repeated mistakes exploration assessment may unknowingly be exposed to. The lookback contribution to portfolio management is properly called performance tracking.

Likely inspired by the After-Action Review (AAR) process installed by the U.S. Army about 50 years ago, oil industry published results of tracking predictive performance began via a simple cross plot (of pre-drill prospect resource size versus post drill accumulation resource size) by USGS workers documenting discovery sizes on the US Continental Shelf. Curiously pre-drill estimates made by the USGS were relatively accurate.



Subsequent publications by the industry of pre-drill prospect size estimates versus post drill accumulation sizes have often documented recurring optimistic bias.

Other contributions have demonstrated the utility of determining (1) the efficiency of prospect ranking by various pre-drill estimation parameters (via an estimation efficiency plot), (2) when a drilling program falls outside of statistical control (via a sequential aggregation plot); and (3) where along a series of pre-drill forecast distributions thematic estimation bias has occurred (via a percentile histogram). These basics can serve as a starting point for any company to build their own baseline study to learn what aspects of their myriad estimates should improve.

Method

While conducting an audit of recent larger discoveries across industry, Bond and Bagley (2018) noted an interesting pattern when comparing where the discovery size fell relative to that prospect's pre-drill estimate of resource size range those companies used to authorize the prospect for drilling. This pattern illustrated many of those discoveries fell within the lowest quintile (that is, less than the 80th percentile, or P80) of the forecast discovery size distribution.

(Note this paper uses the ‘greater than’ convention, where $P_{10} > P_{90}$.) The pattern reaffirms optimistic bias persists in prospect size estimation, one which past AAPG President Peter Rose has long cautioned (most recently, see Rose, 2017) becomes very detrimental when using drilling portfolios as predictive tools seeking funding. Accordingly, an important part of successful portfolio management is to receive and incorporate feedback from drilling efforts into current and future assessments. We call that effort performance tracking, defined as the process of comparing results to predrill forecasts as a method of experiential learning, far preferable to unknowingly repeating the same mistake. Hence performance tracking is a critical yet often overlooked process to help generate a predictive portfolio, worthy of continued exploration funding. This note collects the salient points from past predictive performance studies in historical order to provide context to that persistent bias and a construct to help companies conduct their own studies to fortify portfolio management efforts.

While most companies have overestimated the amount of discovered resources from exploration, there are notable exceptions. A US Major oil company revealed a lookback of their 2012 - 2016 global exploration portfolio to document predictive performance during the period. The disciplined and thorough work indicated underestimated resources for the five-year period. Notably, the problem was: (a) not widespread, but limited to a single reservoir in a single trend; and (b) the underestimation was on the high side of the EUR distribution, a stunning departure from earlier problems historically described by Rose (2017). These bits of valuable information are readily actionable and shareable. Persistent underestimation can lead to chronic under-valuation, a pernicious state when the main goals of exploration are typically growth, and a predictive portfolio, worthy of repeat funding.

Citron and others (2017) reported results of a 2015 survey of a Risk Coordinators Network, where 37 of 48 (77%) company ‘assurance’ teams state that they regularly conduct post well reviews. Of those teams, approximately half claim to annually share the results compiled from those reviews with management. Only 40% of those team’s report sharing that information with the exploration staff (ironically, where the assessment work is done). Sharing of performance tracking data and analysis is apparently still in its infancy and can be considered as low-hanging fruit to improve exploration portfolio management.

Conclusions

Not unlike the few people covered in President Kennedy’s book Profiles in Courage (Kennedy, 1956), performance tracking studies in the E&P literature are few and far between. Yet a clear case can be made for that courage, as they should be a regular part of managing an E&P portfolio to ensure learnings from well results are regularly factored into new prospect estimates. This summary serves to illustrate a starting point for companies to begin such informative studies. Learning from those experiences serves to make portfolios more reliable predictive tools deserving of repeat funding, and often distinguishes the best performing companies from the rest.



References

Bond, M., and Bagley, G., 2018, Prospect Risk and Volume Benchmarking Using Wildcat; available at <https://www.westwoodenergy.com/publications-shop/>.

Citron, G.P., Carragher, P., and Bond, M., 2017, Exploration Assurance Team Best Practices, AAPG Search and Discovery Article #90291, presented at the 2017 AAPG Annual Convention and Exhibition, Houston, Texas, April 2-5, 2017.

Kennedy, J.F., 1956, Profiles in Courage, Published by Harper and Row, New York, 272 pp.

Rose, P.R., 2017, Evolution of E&P Risk Analysis, AAPG Search and Discovery article # 90291.