

# Measuring What We Think We'll Find: A 20-Year Perspective on E&P Risk Analysis

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The fundamental geotechnical, statistical, and economic concepts that underpin today's standard E&P risk analysis and portfolio management have been in place for at least 50 years. From about 1985 to about 1995, a general methodology evolved and converged among many large companies and some consultants. AAPG publications, oral papers, and Hedberg Conferences were instrumental in this process. Additional refinements since 1993 include (1) probabilistic play analysis; (2) sophisticated risk analysis of complex traps; (3) integration of risk analysis with economic evaluations; (4) utilization of probabilistic project evaluations in company inventories and portfolios; (5) consideration of psychological and organizational influence on project evaluations and selections, and (6) education of top management in use of probabilistic project evaluation in decision making.

Extraordinary advancements in computer capacity and software refinements have now brought sophisticated risk analysis within the routine reach of every geotechnical PC user. Even so, many of the remaining challenges represent "people problems", not technology problems: (a) Consistently and routinely assessing real-option values of E&P projects to realistically express their true value; (b) Consistently assessing the value of unconventional resource plays; (c) Usefully and routinely employing probabilistic evaluations of development and EOR projects; (d) Realistically assessing high-risk, high-potential "company-maker" plays within the context of E&P portfolios; (e) Routinely carrying out full-probabilistic DCF economic analyses in time-effective ways; (f) Effectively eliminating stubborn human biases related to excessively narrow ranges of uncertainty, and inherent optimism; (g) Developing corporate incentive systems that are compatible with delivering on geotechnical promises.