



Mispar Consulting
M A K I N G R I S K C L E A R

Our Value Proposition

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In a nutshell

- Every business faces an uncertain future, but the uncertainty inherent in capital-intensive commodity firms is bigger than most.
- We help you translate those uncertainties into dollars.





Nobody Can Predict the Future

- Every forecaster is wrong.
- More than most industries, the commodity business lives with hideous uncertainty
 - Probably the only people that truly appreciate our plight are farmers
- So why does everyone show you spreadsheets with point forecasts?
 - Flat Price, two scenarios, Nymex, etc – they are all *very poor* substitutes for proper risk analysis
- The fact is – risk analysis is *hard*. It requires sophisticated approaches and patient explanation.
- But, done well – it can reveal the cliffs. And the opportunities.





But I'm in the <> Business!

- Unfortunately, in today's world, it's not good enough to just have great operational knowledge.
- Investors and lenders are analyzing how risky you are. If you don't do that analysis, in a numeric sense, you walk in to those negotiations one step behind.
- In the past 30 years, basic economic analysis has become commonplace.
 - But it's usually simple scenarios.
- The next few pages describe how we put numbers on risk.





Isn't Insurance for Risk?

- Insurance is part of the way to address, or handle some risks.
 - But almost all of it is so-called “pure” risk: there is only risk of loss, not gain.
- Financial risk stems from the variability in outcomes possible from operations: variability in subsurface results, costs, prices/revenues.
 - The reserves you actually find – the prices you sell for – the costs to produce
- We help you clarify your *financial* risk exposure.





Risky Project Economics

- “Aries (Wellspring, etc) does this for me!”
- But can it tell you the chance that you don’t make enough money?
- Let’s take a hypothetical project with a minimum return desired of \$2M.





Risky Project Economics

$$\text{NPV} = \$3.3\text{M}$$

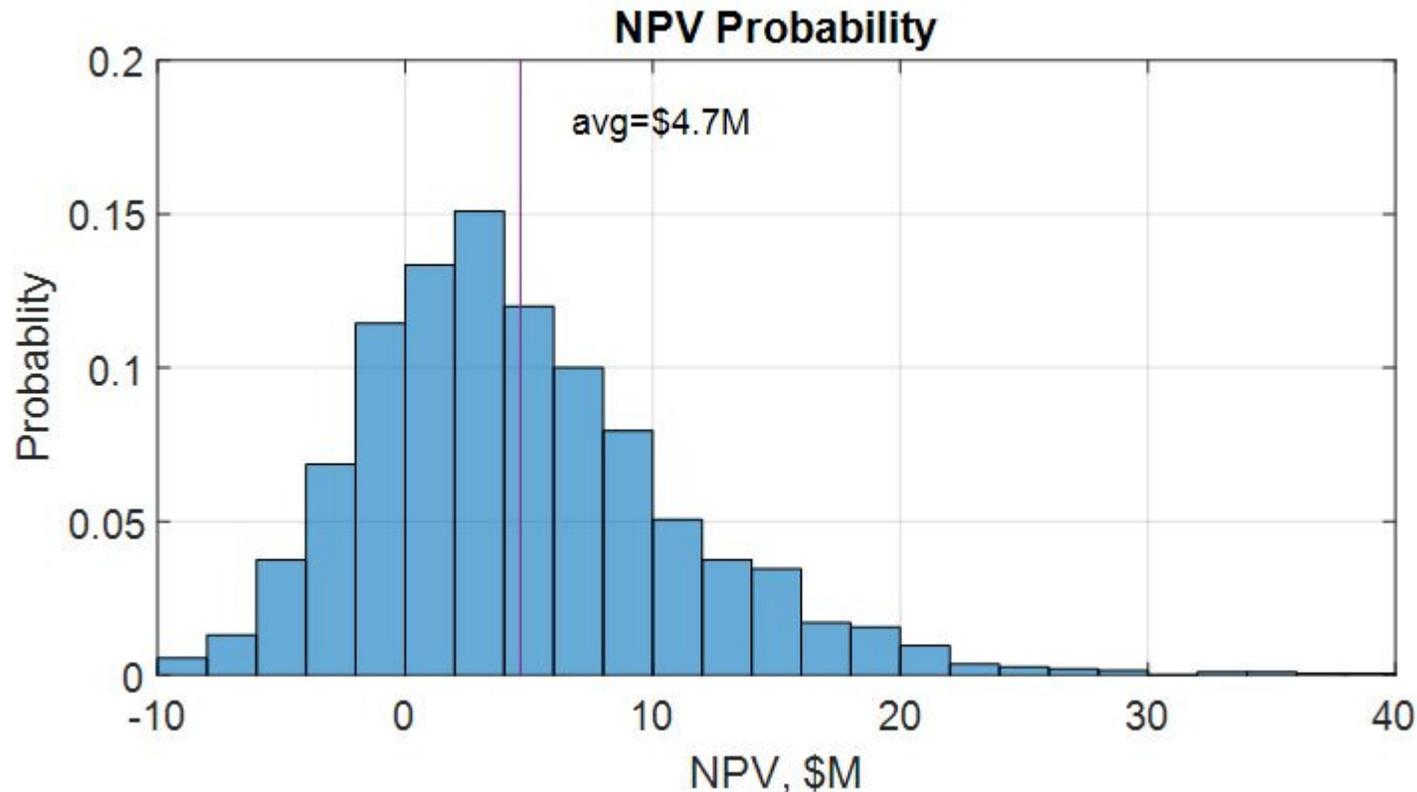
- An NPV tells you an average – let's say \$3.3M.
- But what's the chance you lose money on the project?
- What's the chance that you make your minimum return?

All numbers are synthesized





Risky Project Economics

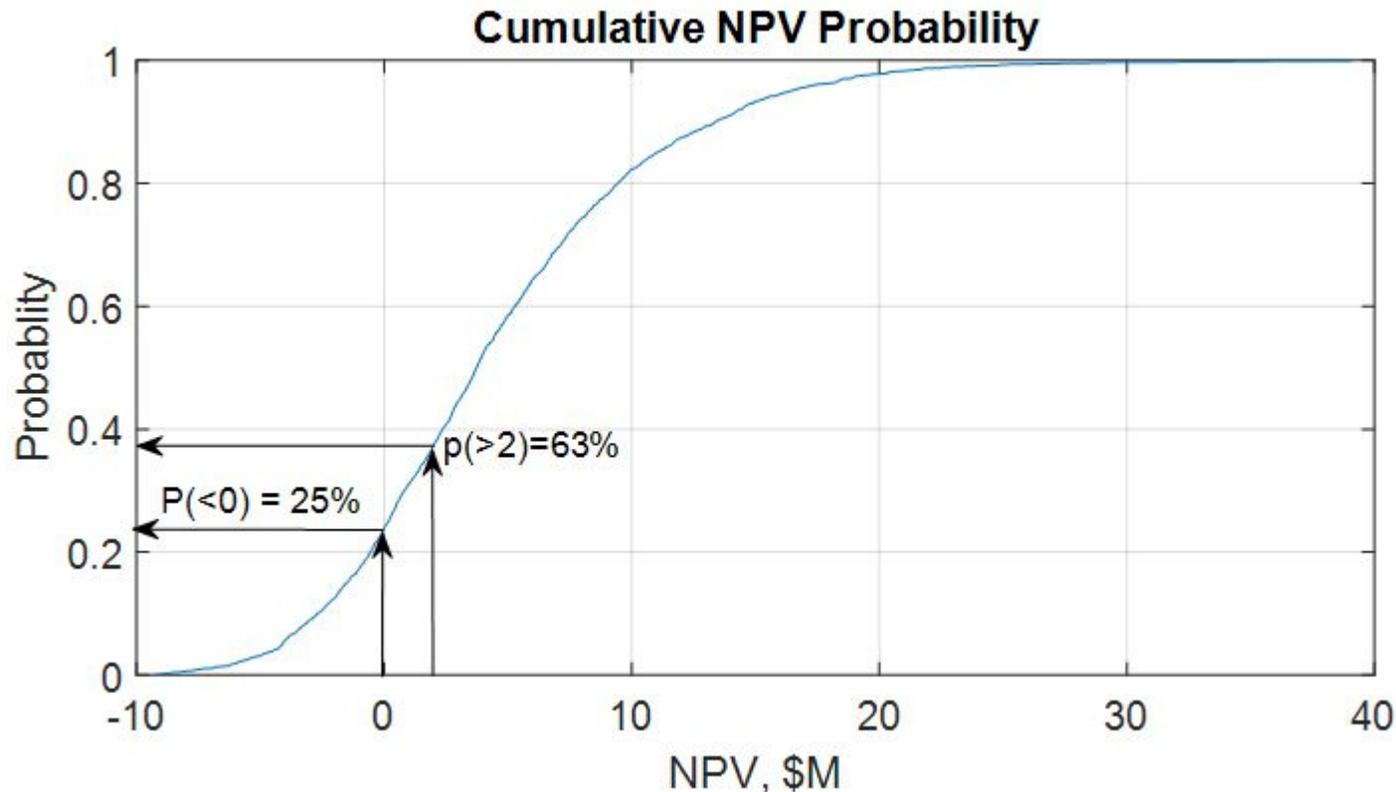


- If we had the expected spread of results – now we can answer these questions.





Risky Project Economics



- If we add up the probabilities – 63% chance of > minimum return.
- 75% chance of at least making money. 30% chance of making > \$5M.

Hypothetical Wolfcamp B well





Value of Information

- If a project has multiple phases, and the results in one phase influence the next, then there is value in that information
 - If there is a decision to terminate early, you can “prune” the tree – and save money



- The can be combined with Risky Economics to describe the life of a project, or done in a single-point manner
- This is well-suited for non-commodity projects as well.





Robustness Analysis

- Even without performing a full-blown risk analysis on each project, you want to know some semi-numerical measures, and your current tools can't help:
 - Breakeven flat prices – what future flat prices gives you a minimum return? Comparing IRR to some hurdle rate helps, but isn't a \$40 breakeven much easier to understand?
 - Shutdown economics – a what price does it make sense to just shut down a well? Many unconventional wells don't come back completely if they are shut in, adding significant complexity to the decision.
 - Profitability analysis – What's the most efficient use of your capital? Doesn't \$1M to make \$5M (NPV) sound much better than \$5M to make \$10M?





Portfolio Analysis

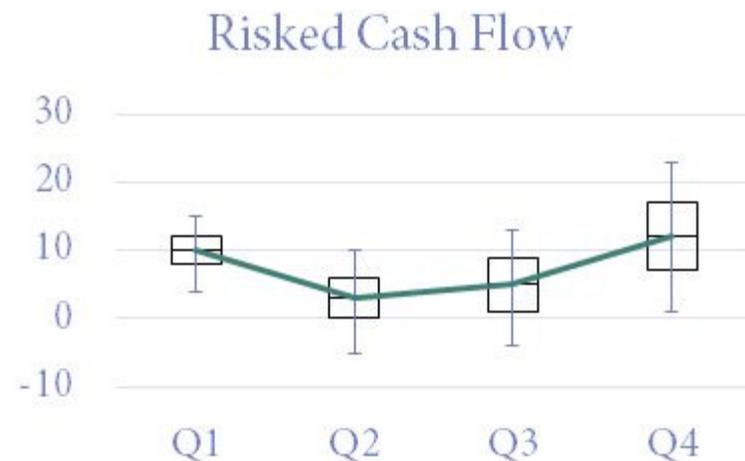
- You've got 10 different opportunities, but limited capital. Which ones first?
- Simple NPV ranking could break the bank. It tends to recommend the largest projects, regardless of risk, or profitability.
- It's obvious when we say it, but we want to maximize return on capital, not project value. They are not the same.
- If it's 10 different wells in the same area – that's easy. 10 different in several areas – harder.
- The hardest job is to balance opportunities with built-in options, e.g. operated and non-operated opportunities. Operated usually has a built-in deferment option that non-op does not.





Business Plan Analysis

- We can apply the same process to the operation of the entire business.
- Rather than looking at a single forecast cash flow, look at the spread.
- Though it's unlikely, there is a 1% chance that this company would need \$9M in cash through Q2&3 to stay afloat through the year.
- There is a ~20% chance that you'd need ~\$5M for one Quarter.
- There's a 25% chance that 2Q is negative.





Ex: Undeveloped Well Valuation

- An undeveloped well (proved or unproved) is nothing more than an option.
 - How much would you pay for a ticket that has a 20% chance of paying \$100 in a year?
- At today's strip, they are all “out of the money” - NPV's are negative.
- Intuitively, they are worth something, but how to value them?
- That's where these approaches shine. By simulating the future, there are futures that result in positive value, and some that don't. In addition, delay, depending on the lease terms, can add value (or reduce it).
- Conventional techniques just don't give you this information.





Ex: Undeveloped Well Valuation

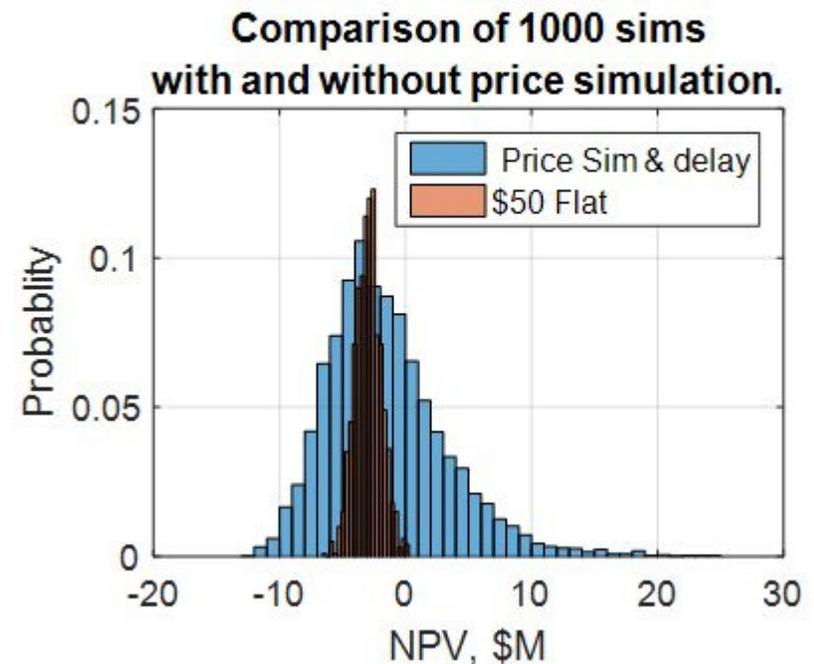
- To simplify, if one possible future has a value of \$4M, and three are negative, then a rational person would be willing to pay \$1M.
- Most “risk-adjusted” NPVs stop there.
- By simulating the future thousands of times, we can vary the subsurface results, prices, costs, etc, and get a good sample of what the future might hold – and therefore, how much something’s worth.





Ex: Undeveloped Well Valuation

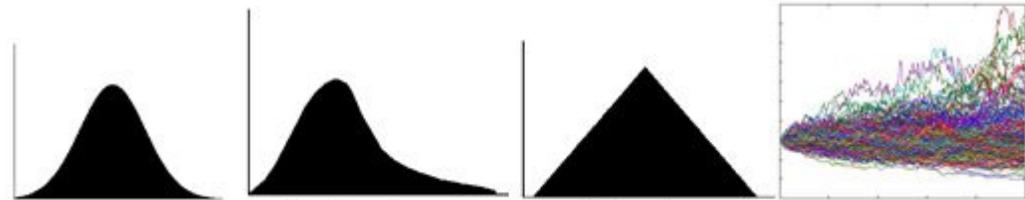
- The \$50 flat case with no simulation NPV = **(\$3.0M)**
- With only subsurface and drilling uncertainty = \$400
- Including price uncertainty = \$72K
- Including the option to delay: \$1.2M
- Conventional approaches are inadequate.





How Do We Do It?

- Start with the normal project economics. This uses averages for everything, and a single forward price curve.
- Put in the variation on everything that is uncertain – subsurface, D&C costs, prices in this case.



- Recalculate NPV (or other important measure) thousands of times, taking a random, value from each distribution for each variable.
- That's how risky the future looks, in numbers.





Why Isn't this Done More?

- It's hard, which usually means expensive. You have to move beyond spreadsheets.
- Decision makers sometimes find it hard to understand.
- Depending on what you're doing, if you do enough of these, the law of averages catches up.
 - If our last example was an onshore well: if you run 5 onshore rigs, you'll drill about 100 wells in a year. Some may be losers, but some will be real winners, and you should hit the average overall.
 - So if you're big enough, you don't have to care.
- We believe we can upend the analysis economics, by distributing the overhead over many clients.





What's Wrong with NPV?

- Current approaches often start down the road to simulation – a few scenarios, with a probabilities, to keep the problem easy to handle with a spreadsheet.
 - But people are horrible at estimating the risk of future events.
- Some approaches increase the discount rate for riskier assets.
 - But that essentially values near-term cash flows the same for more and less risky assets.
- Price scenarios help you understand the range of possible futures – but not the likelihood.





What next?

- Contact us for a detailed discussion of your business issues and how we can clarify – and enumerate – your financial risk picture.

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