

# Decision-Based Management<sup>SM</sup> [Quantifying Risk to Clarify Decisions]

Bio '97 / Houston

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# Outline



## ■ Theoretical

- What is Risk?
- Decision-Based Management<sup>SM</sup>

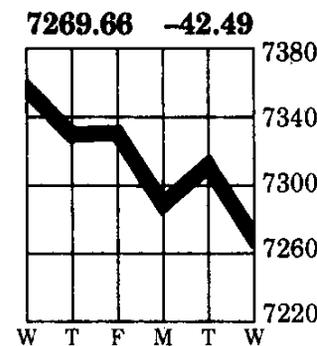
## ■ Practical

- GeneGenie Co-Promotion Decision
- Monte Carlo Model

## ■ Conclusions

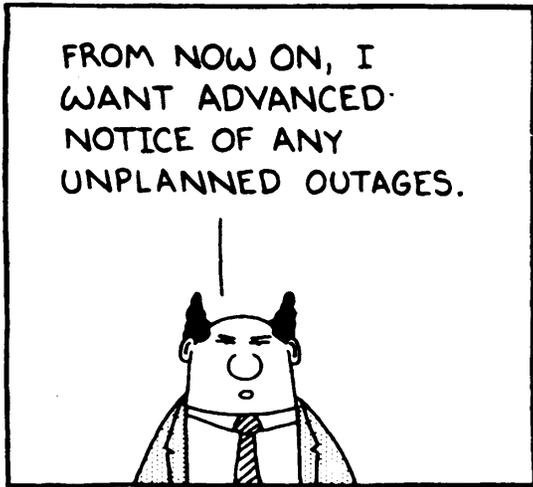
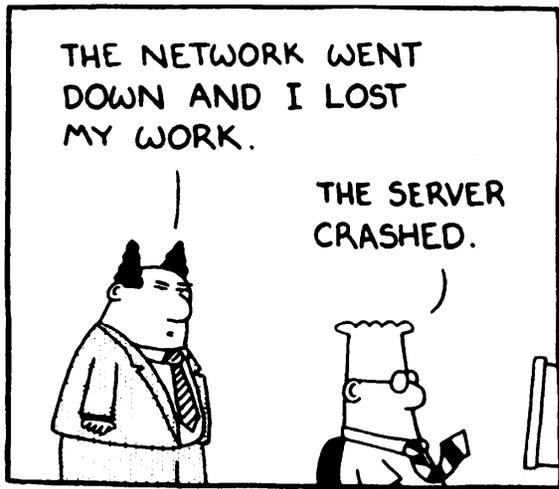
# What is Risk?

- Is flying risky?
- Is buying a lottery ticket risky?
- Is eating sushi risky?
- Is the stock market intrinsically risky?
  - Buy a house next week
  - One year-old boy



# Risk is How Uncertainty Affects You

- Uncertainty: How long to get to airport?
- Risk: Will you spend Thanksgiving in the airport?
- Risk = uncertainty + consequence + values
- Risk ...
  - can't be looked up in a book
  - can be measured using models
  - can be managed and minimized



# Decision-Based Management<sup>SM</sup>

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## ■ Information $\Rightarrow$ Decision

- “If we have good information, our company will be successful”
- Information is expensive (\$\$\$)
- Information is infinite
- Too much info. can confuse
- Much data gathering is useless for making decisions

## ■ Decision $\Rightarrow$ Information $\Rightarrow$ Decision

- “If we make good decisions, our company will be successful”

# Decision-Based Management<sup>SM</sup>

## Benefits

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- Better decisions
- Clarity of action
- Less costly
  - Targeted information acquisition
- Tailored for specific situation
  - Reflect your situation and needs

# Decision-Based Management<sup>SM</sup>

## Steps

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- Clarify decision / objective
  - Solve the real problem
- Identify alternatives
- Identify what info is needed
  - Known
  - Unknown
- Quantify uncertainty
  - Ranges around input variables
  - “What would surprise you?”

# Decision-Based Management<sup>SM</sup>

## Steps (cont.)

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- Quantify values and preferences
- Build model in Excel
- Run Monte Carlo simulation
  - Using Crystal Ball
  - Analyze thousand scenarios
- Review:
  - Preferred alternative (deterministic results)
  - Value of info. and control (sensitivity analysis)
  - Quantification of risk (stochastic results)

# GeneGenie's Situation

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- Smaller biotech company
- Product in Phase III (GG1)
- Other products to follow (GG2)
- IPO raised \$40 million
- GeneGenie is still concerned about cash

# GeneGenie's Situation (cont.)

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## ■ Decision:

- License rights to GG1 (rejected)
- Market and sell by self (Alone)
- Contract sales force (Rent)
- Delay and reduce expenses (Bootstrap)
- Co-promote w/big pharma partner (Partner)

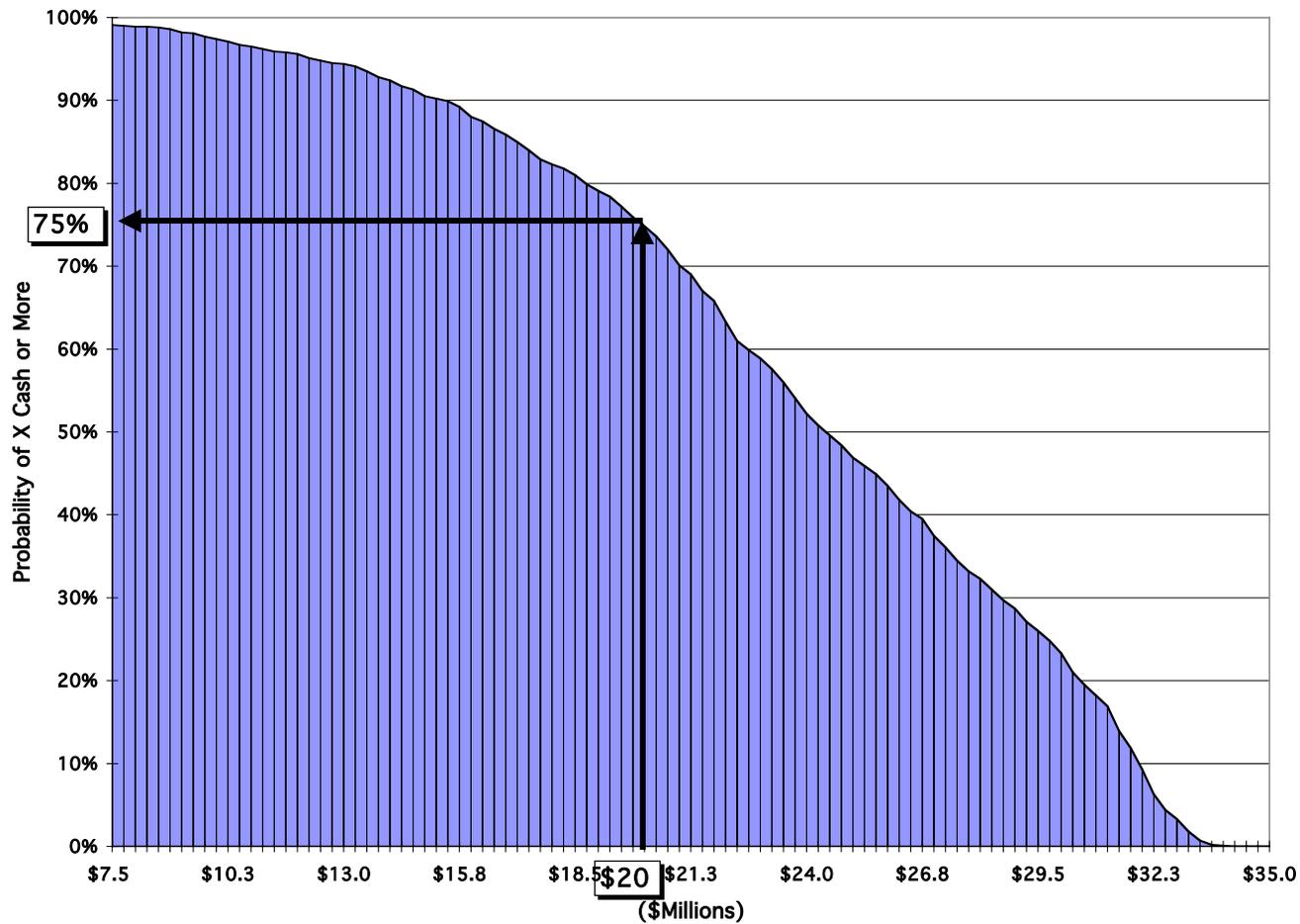
## ■ Gather info. to answer this question

# GeneGenie's Situation (cont.)

- Uncertainty: How much cash will they have?
- Risk: Will they need to resort to desperate measures (“cash crisis”)?
  - Bankruptcy
  - Acquisition
  - Divest assets
- 5-Year NPV vs “Cash Crisis”
  - Profits versus cash flow risk

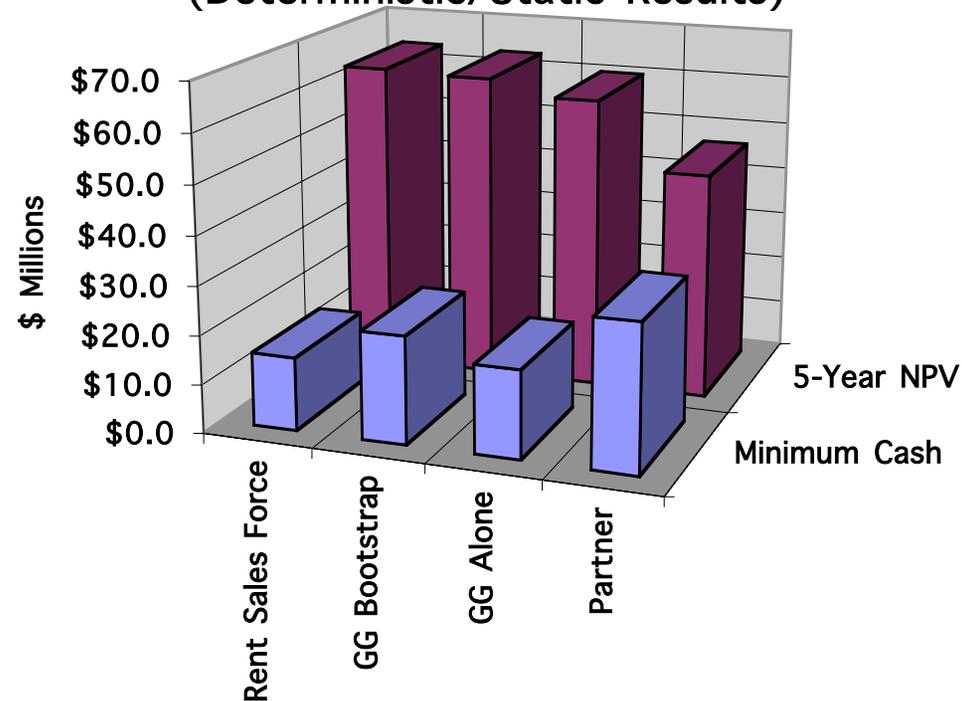
# Minimum Cash Chart

GeneGenie Minimum Cash CDF  
(Rent)



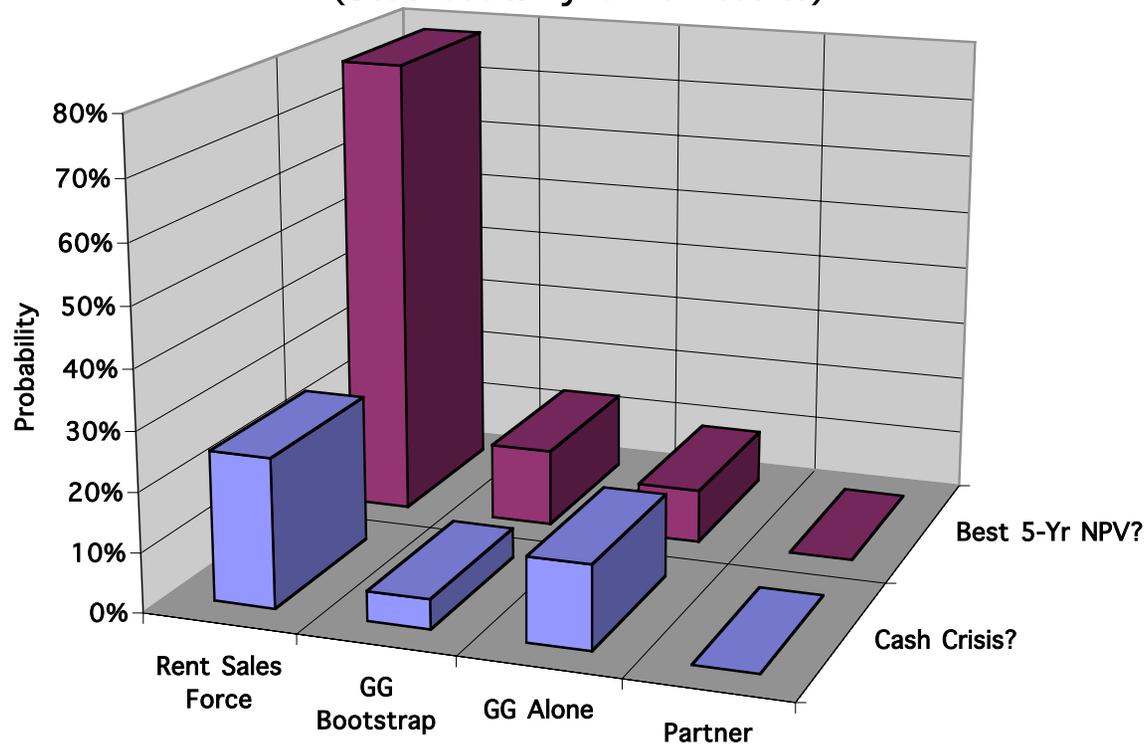
# Deterministic Results

## GeneGenie Promotion Alternatives (Deterministic/Static Results)



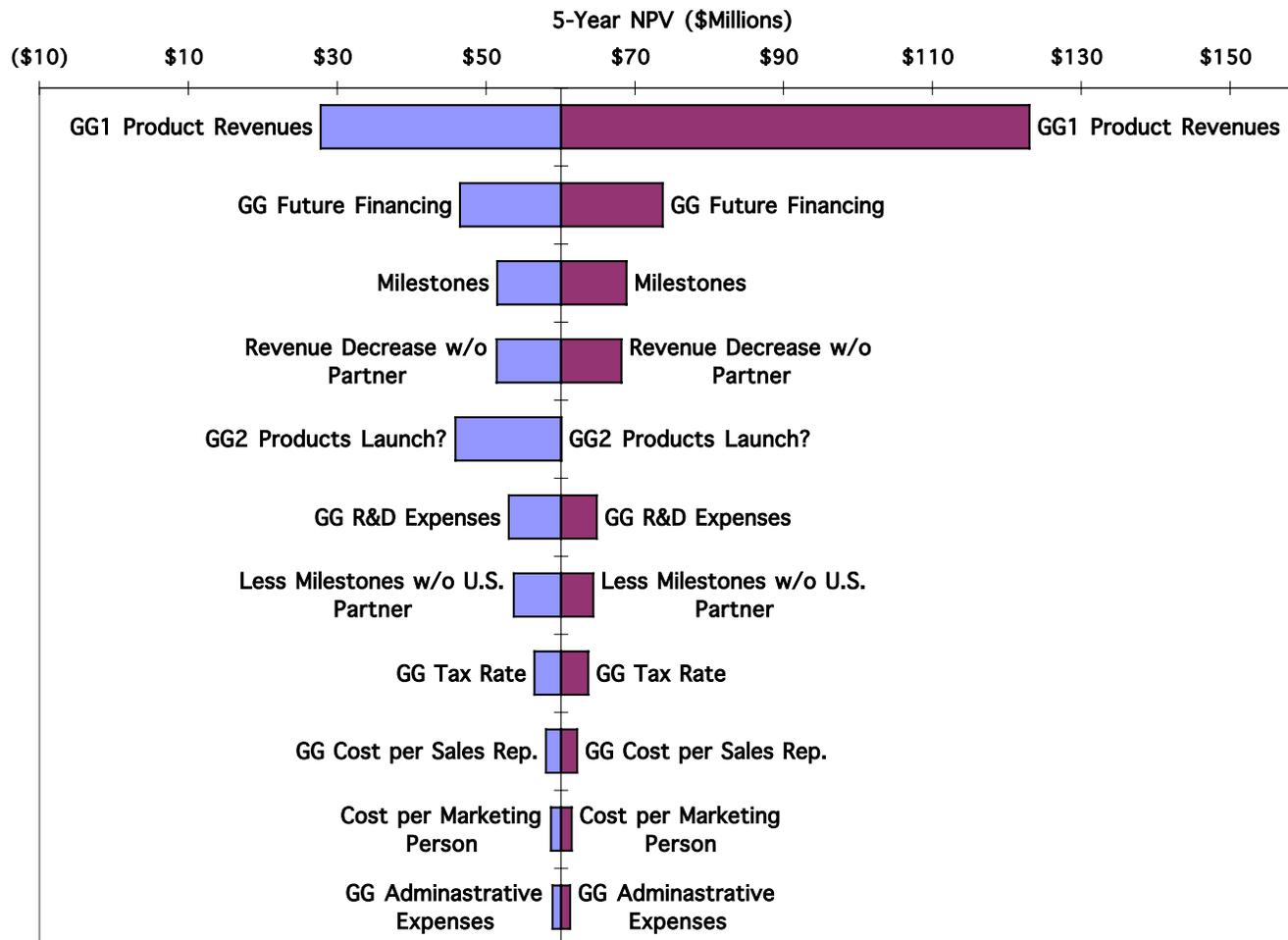
# Stochastic Results

## GeneGenie Promotion Alternatives (Stochastic/Dynamic Results)



# Sensitivity Analysis

## GeneGenie Value of Control



# Conclusion

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- Risk is how uncertainty affects you
- Decision-Based Management<sup>SM</sup> is decision-focused, not information-focused
- Decision-Based Management<sup>SM</sup> quantifies risk to aid decision making
  - Measure risk
  - Manage and minimize risk
- GeneGenie traded maximizing profits for minimizing risk and chose “Partner” alternative