Parametric Modeling in Decision Analysis

DECISION

DS

STRATEGIES

**Gerald A. Bush - Decision Strategies, Inc.**

Strategic Decision Situation

- A major energy company had been offered $1.1 B to divest of its commodity chemicals business.

- Prices had been depressed for a number of years, creating a drag on earnings for the corporation.

- With prevailing business conditions, the offer for the business was higher than the value of operating it.

- Before agreeing to the offer, the CEO requested a decision analysis to be done to confirm this decision.
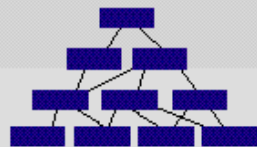
Integrated Decision Management -a structured thinking methodology
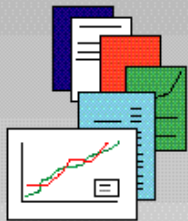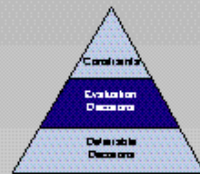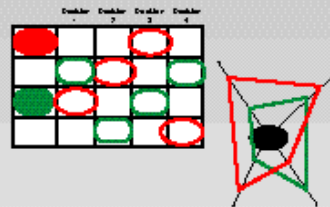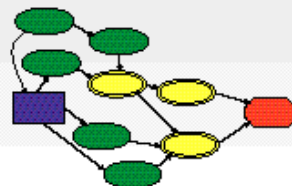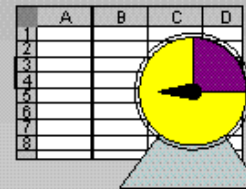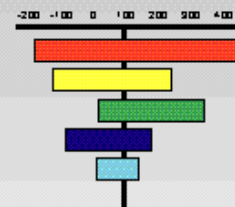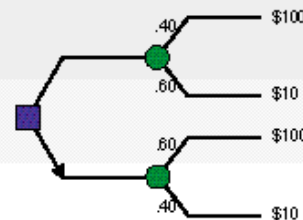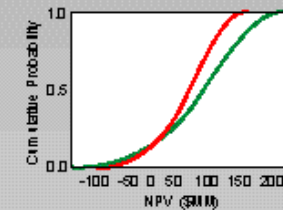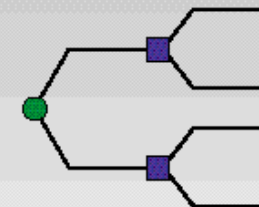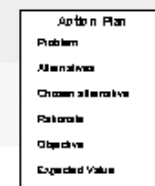
At the end of the evaluation step, there was not clear agreement...
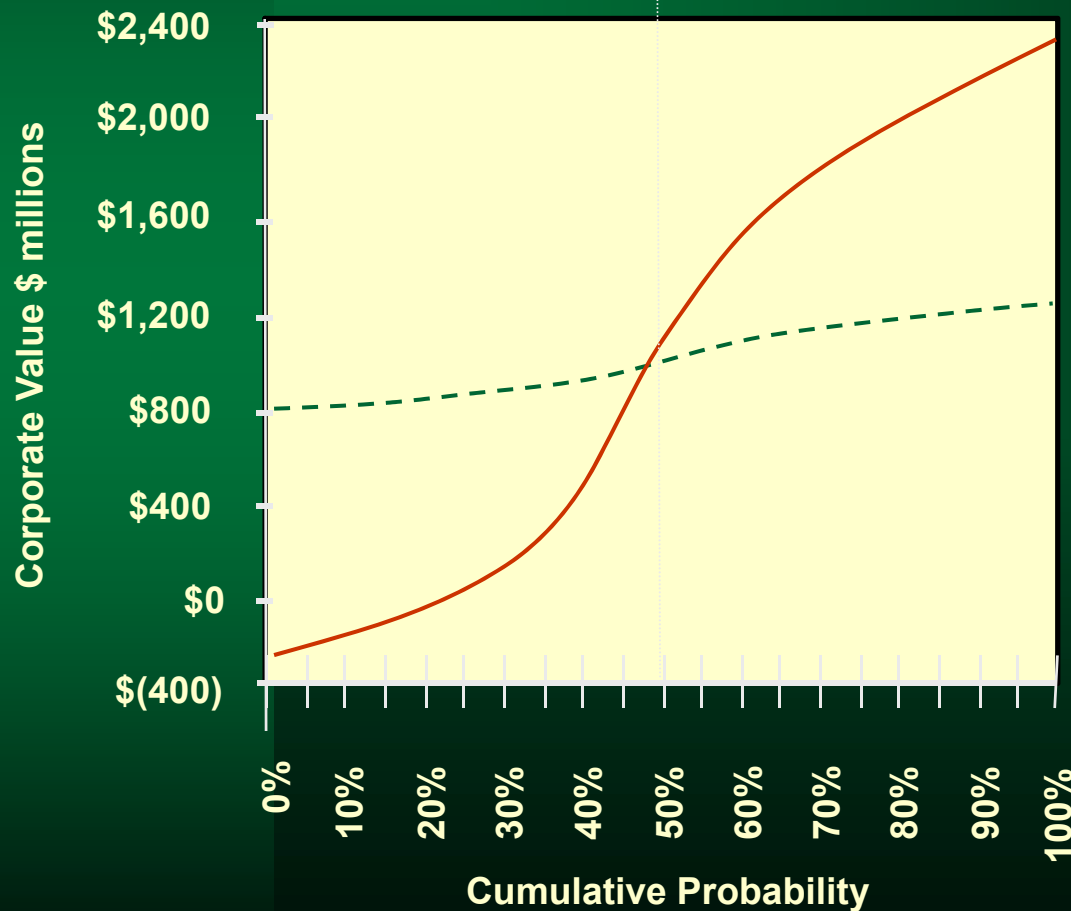
Invest and Grow
Expected Value = $1,150 million
Range = $(350) to 2,350 million

Divest Business
Expected Value = $1,100 million
Range = $800 to 1,200 million

What is the basis for making this decision?

Corporate Value $ millions

$2,400
$2,000
$1,600
$1,200
$800
$400
$0
$(400)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Cumulative Probability

The Tornado diagram offers insight into the key uncertainty

(400)	0	400	800	1,200	1,600	2,000	$ millions

Divest Business

Corp. OH Elimin.

Goodwill Write-off

Invest and Grow

Commodity Pricing

Production Costs

Market Share

Volume Sold

W Time to Market

Product Taste

GW Market Share

Competitor Launch

Price per Patient

Development Costs
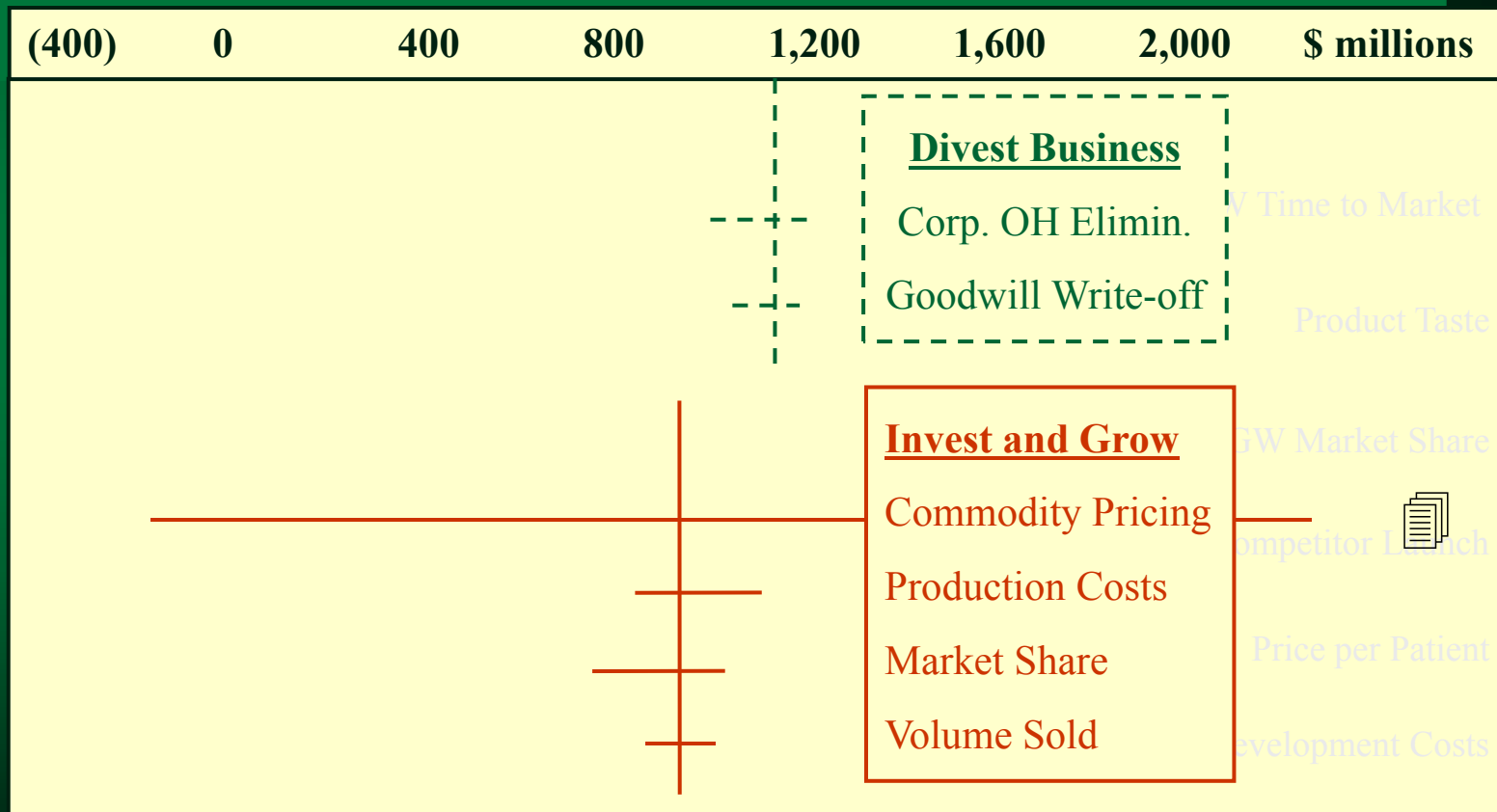
How was Commodity Pricing framed in the evaluation model?

Demand

Pricing

Share

Sales

Revenue

Efficiency

12% WACC

Cash Flow

Invest and Grow

Unit Cost

Expenses

10 Year Period

Material.

Divest Business

Capital

Shipping

Marketing

R&D

Technology   Equipment
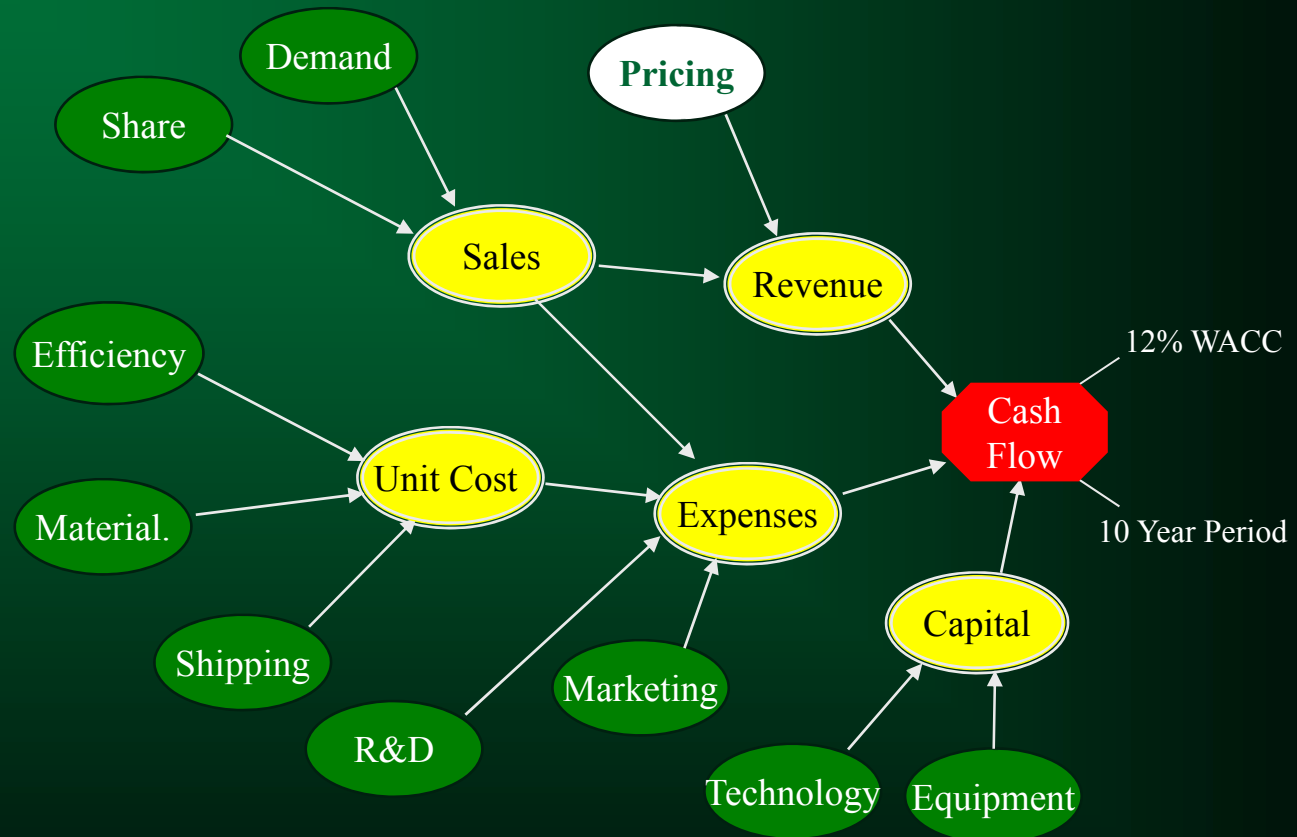
The Expert provided a simulated pathway for the 10/50/90 pricing
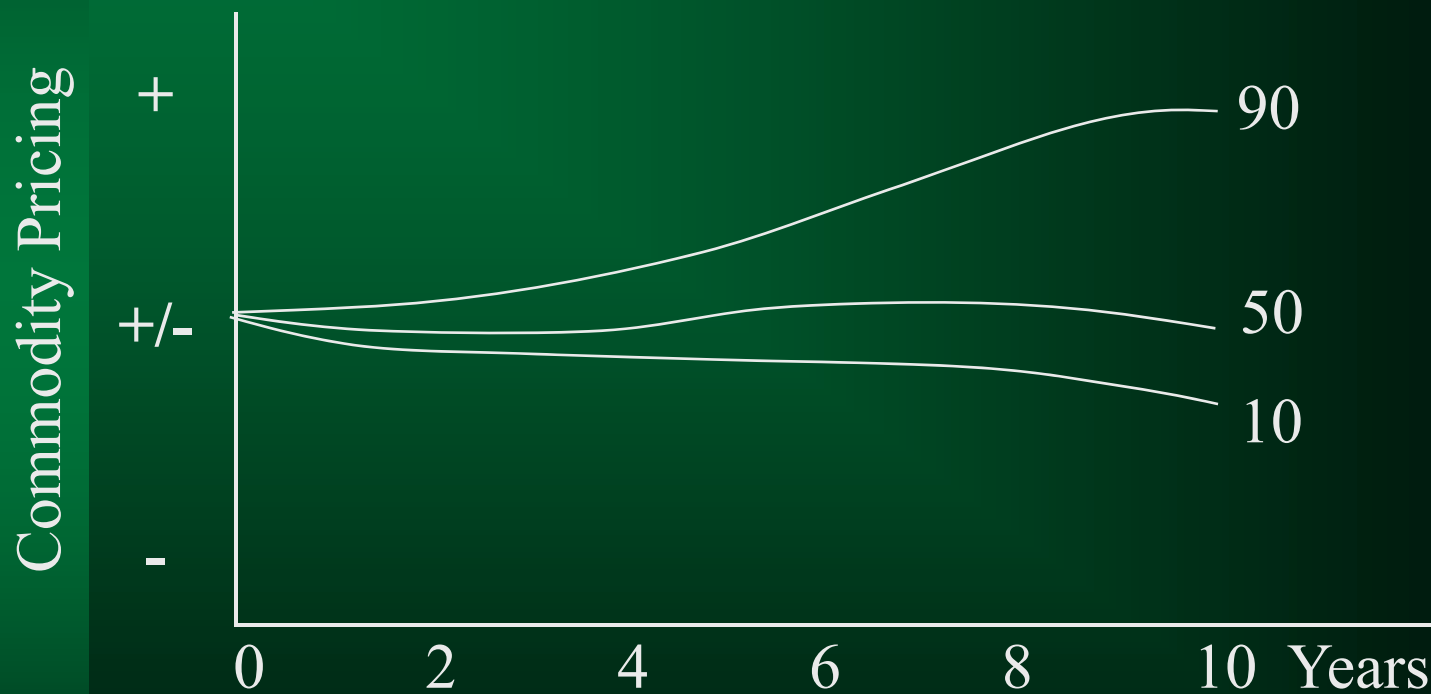
This approach offered little insight for the decision maker to use.

The Framing of the Uncertainty was blocking any real insights

Initial Analysis

Pricing

Forecast price

(average above or below current)

A graph of a commodity price cycle shows the key parameters
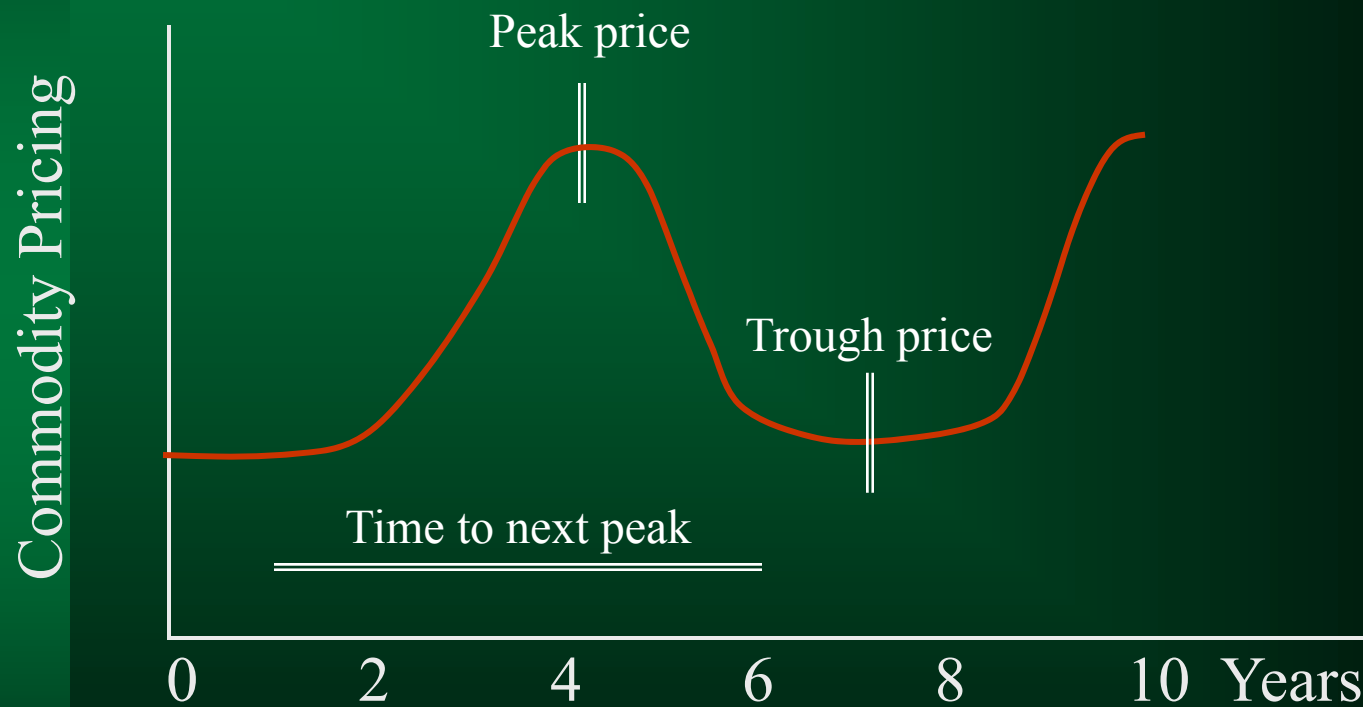
A 10/50/90 assessment was gathered for each parameter.

Parametric analysis gets into the components of variability

	Initial Analysis	Parametric Analysis
Pricing	Forecast price (average above or below current)	Cycle peak Cycle trough Cycle frequency Other conditionals

An updated Tornado diagram enabled a focus on "cycle timing"

(400)	0	400	800	1,200	1,600	2,000	$ millions

Divest Business

Corp. OH Elimin.

Goodwill Write-off

Time to Market

Product Taste

Invest and Grow

Time to Peak

Trough Pricing

Peak Pricing

Development Costs
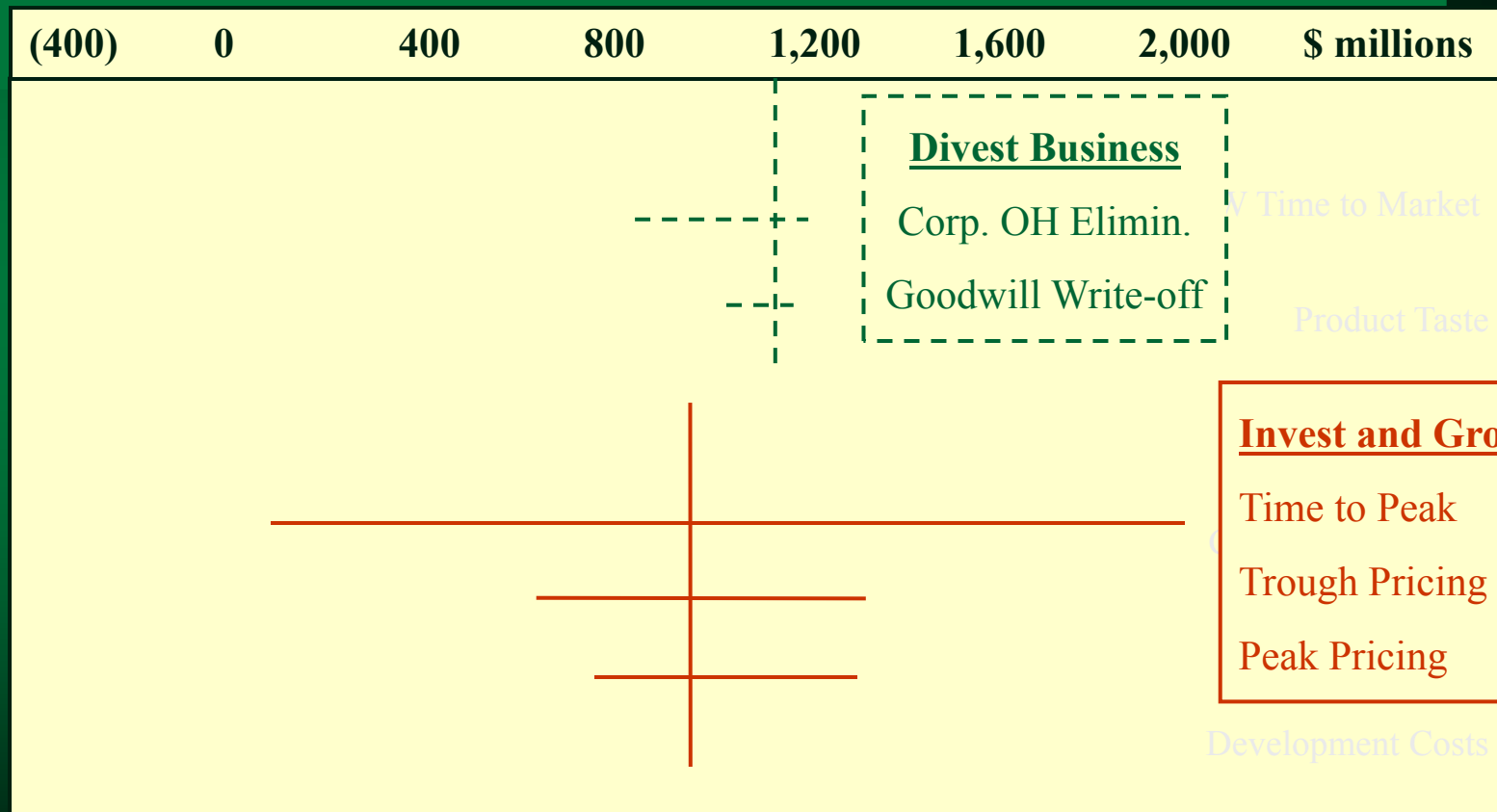
This insight provided the Decision Board with a basis for discussion

Strategic Decision

Time to Peak

Invest & Grow

- 1 year — $ 2,000
- 4 years — $ 900
- 6 years — $ 100

Divest — $ 1,100

Each Decision Board member was asked their opinion and probability of when the next price peak might occur.

The probabilities were compiled to calculate an expected value

Strategic Decision

Time to Peak

Invest & Grow — $ 1,540

60% → 1 year → $ 2,000

35% → 4 years → $ 900

5% → 6 years → $ 100

Divest — $ 1,100 → $ 1,100
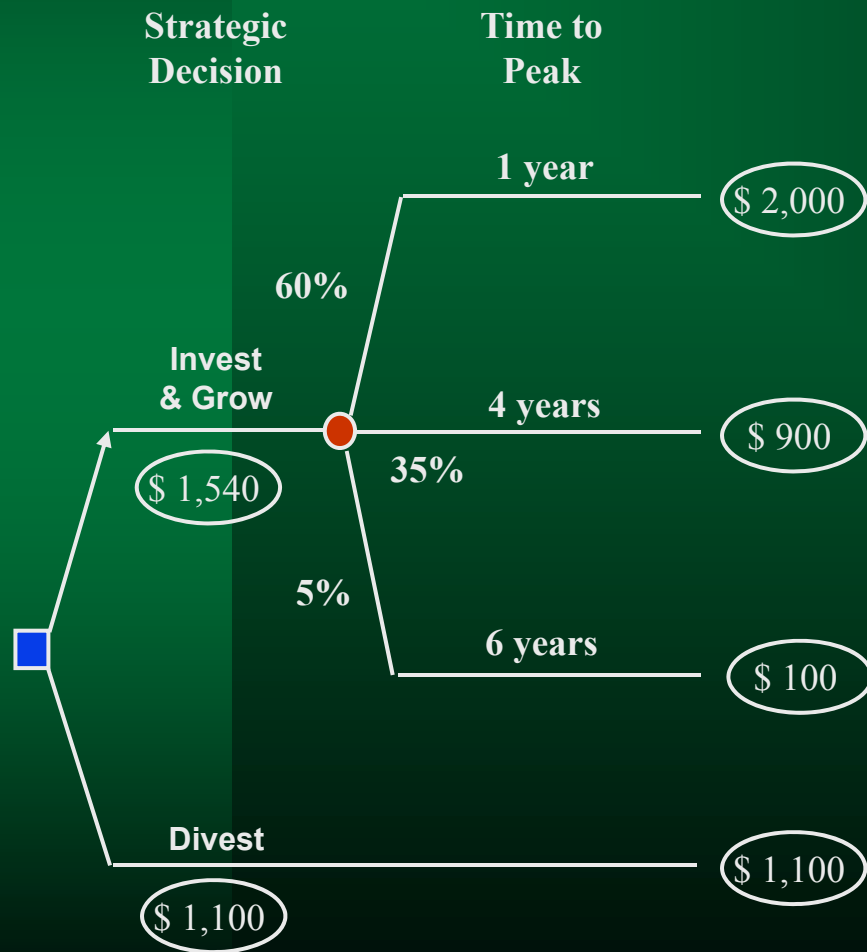
The consensus opinion was that the initial price estimates were biased low by the current conditions. Focus on the cycle peak parameter enabled a clear agreement that a new peak would happen sooner rather than later.

The Value of Information on cycle timing is quite high.

Time to Peak

Strategic Decision

$ 1,740

60%
35%
5%

1 year
$ 2,000
Invest & Grow — $ 2,000
Divest — $ 1,100

4 years
$ 1,100
Invest & Grow — $ 900
Divest — $ 1,100

6 year
$ 1,100
Invest & Grow — $ 100
Divest — $ 1,100

EV = $1,540 million
With a Clairvoyant,
EV(C) = $1,740 million

Value of Information at $200 million suggested checking with industry experts and establishing a watch group for cycle leading indicators.

Implications for the decision

♦ Would have sold the business based on prevailing business conditions, but instead invested in the business and its growth.

♦ Broke with the feast or famine mindset that had been used for most historic decisions.

♦ Created business cycle-dependent strategies for asset acquisition in price troughs and maximum operating output in price peaks.

♦ Also created a cost-advantaged business theme for optimum margins across the full business cycle.

Examples of other Parametric Analysis opportunities

- Oil pricing - cyclicality and other conditionals
- Air fares - market demand, competitive pressures and seasonal interactions
- Electronics - margins through a product life cycle
- Drugs - market penetration rate, patent lifetime and erosion rate by generic products
- IT Benefits - training, adoption and use timeframe

Parametric Modeling in Decision Analysis

Insight comes from how you look at things, rather than how much data you have.

Profile - Gerald A. Bush, Ph.D.

- Gerald A. Bush, co-founder of Decision Strategies, has integrated business process thinking with Decision Analysis methodology. Specialty areas as a DA coach include business strategy development and quick decisions in tight situations.

- Gary's workshops are known for "a high level of relevance to business" and for being "extremely alive and interesting". Gary's clients reflect a significant reduction in the cycle time for decision making and an increase in the value and understanding of decisions made and implemented successfully.

- Gary is a graduate of Hartwick College in New York and the Georgia Institute of Technology in Atlanta. Before founding Decision Strategies, Gary was VP of Corporate Planning for Boehringer Mannheim, a healthcare company. Gary spent 15 years in the healthcare industry in research, product development, quality systems, technology assessment, business development and strategic planning positions.

- Gary's oversees a group of associates in the Atlanta office of Decision Strategies whose clients include a major U.S. airline, a gas services and pipeline group, an international electric power group and a number of other clients in pharmaceuticals, medical diagnostics, information technology and consumer electronics.