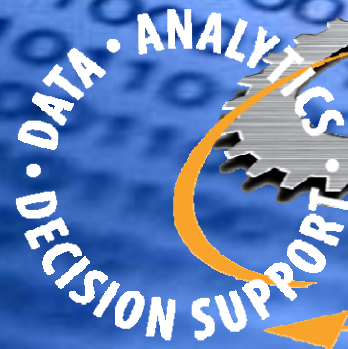


Measuring the Value of Rate Segmentation



DATA • ANALYTICS •
DECISION SUPPORT

David Cummings
ISO Innovative Analytics

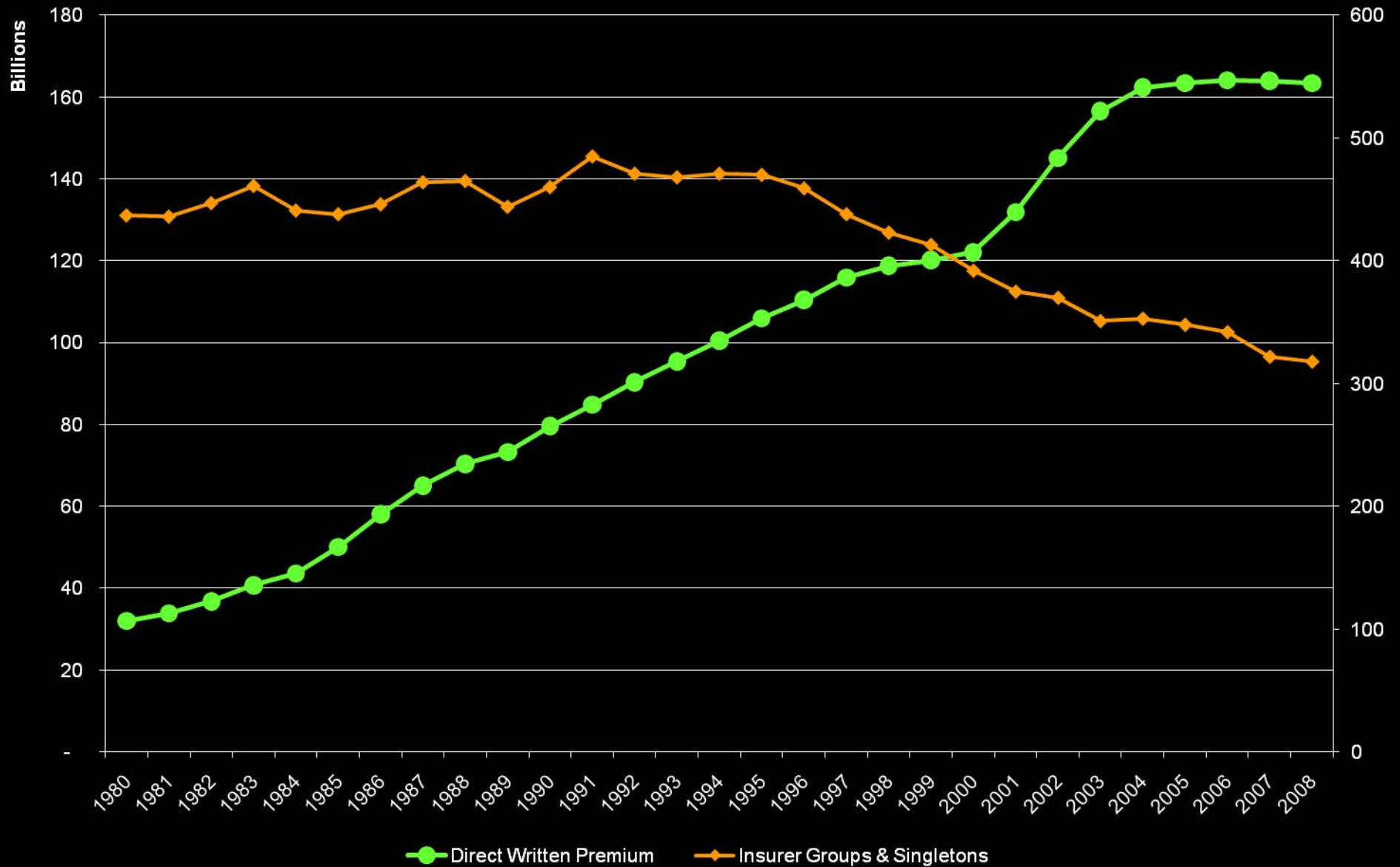
Our Challenge

- Enhanced rate segmentation can add significant value

BUT

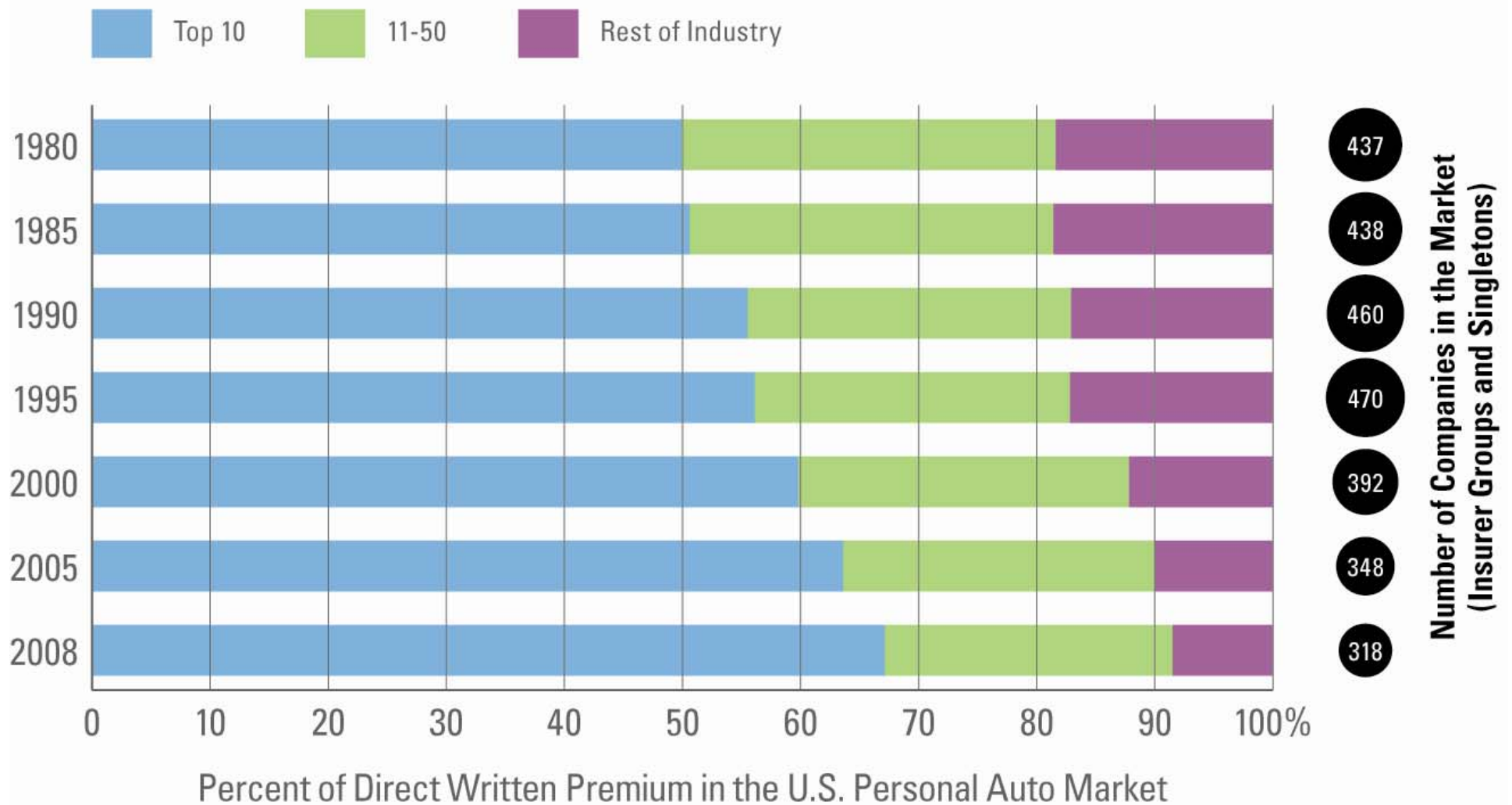
- Increased segmentation has a cost
- How do we evaluate the value vs. cost?
- How do we make the case to decision makers?

Unadjusted Dollars Premium vs # Companies U.S. Personal Auto Market - 1980 to 2008



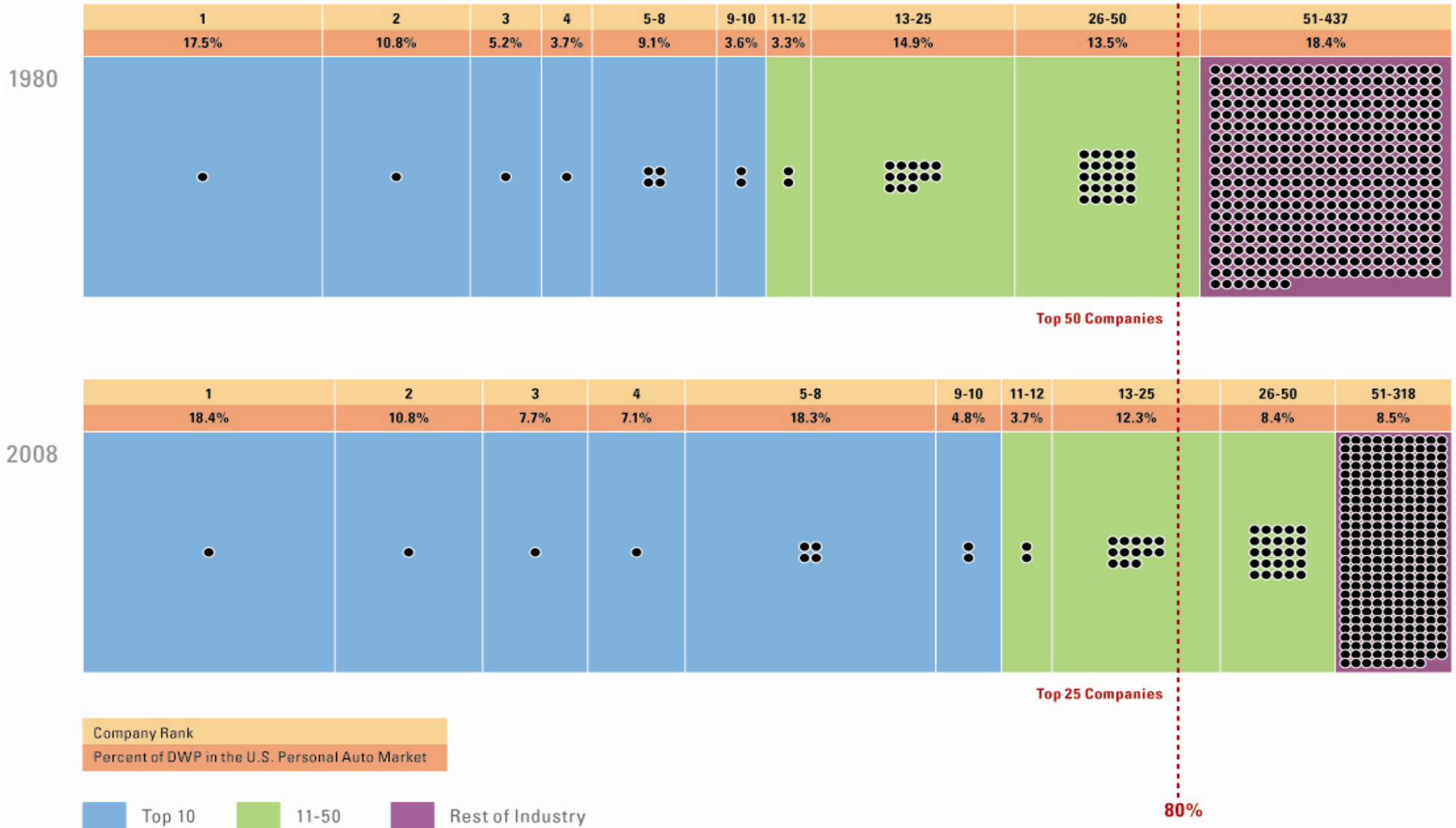
U.S. personal auto market - 1980 to 2008

Market Share by Rank in Market U.S. Personal Auto Direct Written Premium



80/20 Rule in this auto market

Company Distribution: Counts by Market Share for Years 1980 and 2008



How Some Actuaries Make the Case to Increase Segmentation

We need to enhance our analytics in order to maintain our competitive pricing advantage!

I don't want to lose our pricing advantage. How much will it cost to implement an enhanced pricing strategy?



How Some Actuaries Make the Case to Increase Segmentation

It will cost \$10 million to modify our underwriting and agency systems.

**That's a lot of money to spend!
How much additional revenue
will we bring in?**



How Some Actuaries Make the Case to Increase Segmentation

We will implement the new rate structure so that it will be revenue neutral.

You want me to spend \$10 million to get NO additional revenue? That doesn't make any sense!



How Some Actuaries Make the Case to Increase Segmentation

Why doesn't he understand how important this pricing strategy is to our business?

Where can I find an actuary with some business sense?



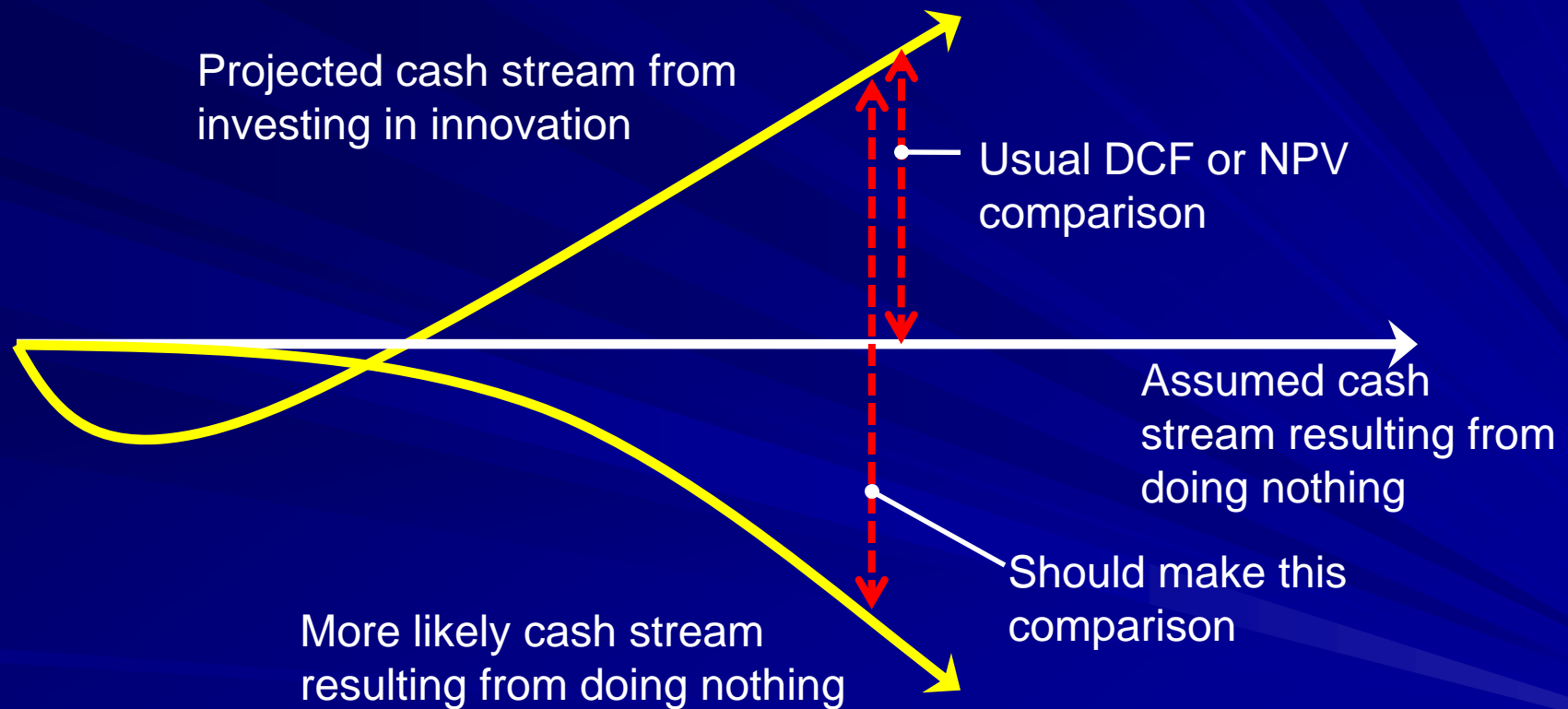
What's wrong with this dialog?

- Focus only on implementation costs
 - In a competitive marketplace, there is a cost to doing nothing
 - Lost business, lost revenue, and increasing cost of remaining policies
- Short-term view of revenue impact
 - “Revenue Neutral” applies only to average premiums on current book
 - There can be long-term revenue impacts

How to make the case better

- Better projections of revenue and profit impacts
 - Look beyond “Revenue Neutral” implementation
- Better consideration of marketplace dynamics
 - Includes customer retention and competitive effects
- Demonstrate the value in monetary terms

The Discounted Cash Flow Trap



Source: Christensen, Kaufmann, Shih, "Innovation Killers: How Financial Tools Destroy Your Capacity to Do New Things", Harvard Business Review, Jan 2008 ¹²

Illustration

- Two insurers write 3 policies each
- Laggard Insurance prices all policies in same class
- Luminary Mutual uses more accurate segmentation
- Both companies have same profit provisions (10% of premium)

Illustration – Initial State

Laggard Insurance

Actual Expected Cost	Policy Premium	Profit
\$600	\$880	\$280
\$800	\$880	\$80
\$1,000	\$880	-\$120
Total		\$240

Luminary Mutual

Actual Expected Cost	Policy Premium	Profit
\$600	\$660	\$60
\$800	\$880	\$80
\$1,000	\$1,100	\$100
Total		\$240

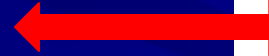


Illustration – After Year 1

Laggard Insurance

Actual Expected Cost	Policy Premium	Profit
\$800	\$880	\$80
\$1,000	\$880	-\$120
\$1,000	\$880	-\$120
Total		-\$160



Luminary Mutual

Actual Expected Cost	Policy Premium	Profit
\$600	\$660	\$60
\$600	\$660	\$60
\$800	\$880	\$80
Total		\$200

New Policy Premium = \$1,027

Illustration – After Year 2

Laggard Insurance

Actual Expected Cost	Policy Premium	Profit
\$1,000	\$1,027	\$27
\$1,000	\$1,027	\$27
Total		\$54

New Policy Premium = \$1,100

Luminary Mutual

Actual Expected Cost	Policy Premium	Profit
\$600	\$660	\$60
\$600	\$660	\$60
\$800	\$880	\$80
\$800	\$880	\$80
Total		\$280



Illustration – After Year 3

Laggard Insurance

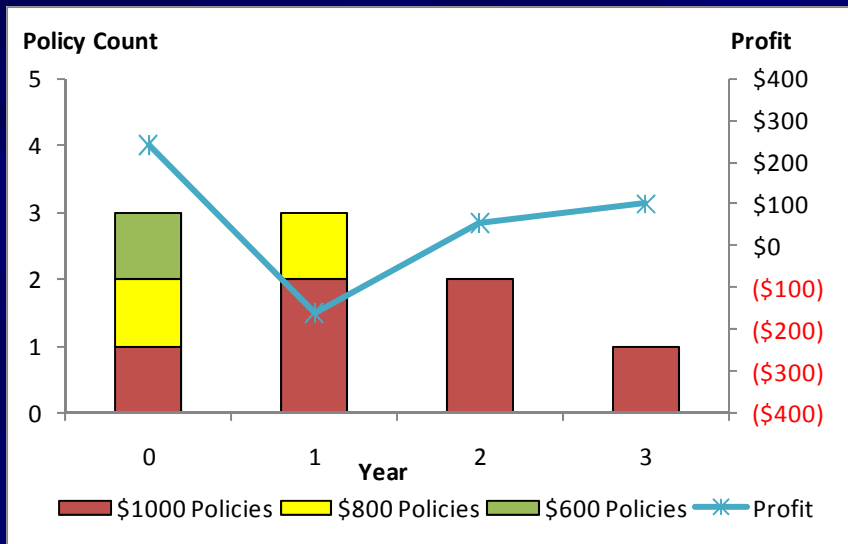
Actual Expected Cost	Policy Premium	Profit
\$1,000	\$1,100	\$100
	Total	\$100

Luminary Mutual

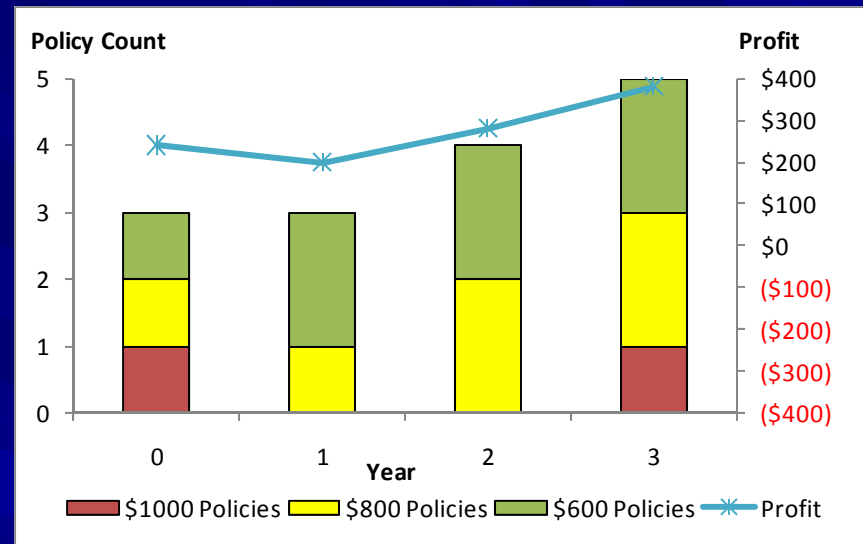
Actual Expected Cost	Policy Premium	Profit
\$600	\$660	\$60
\$600	\$660	\$60
\$800	\$880	\$80
\$800	\$880	\$80
\$1,000	\$1,100	\$100
	Total	\$380

Illustration Summary

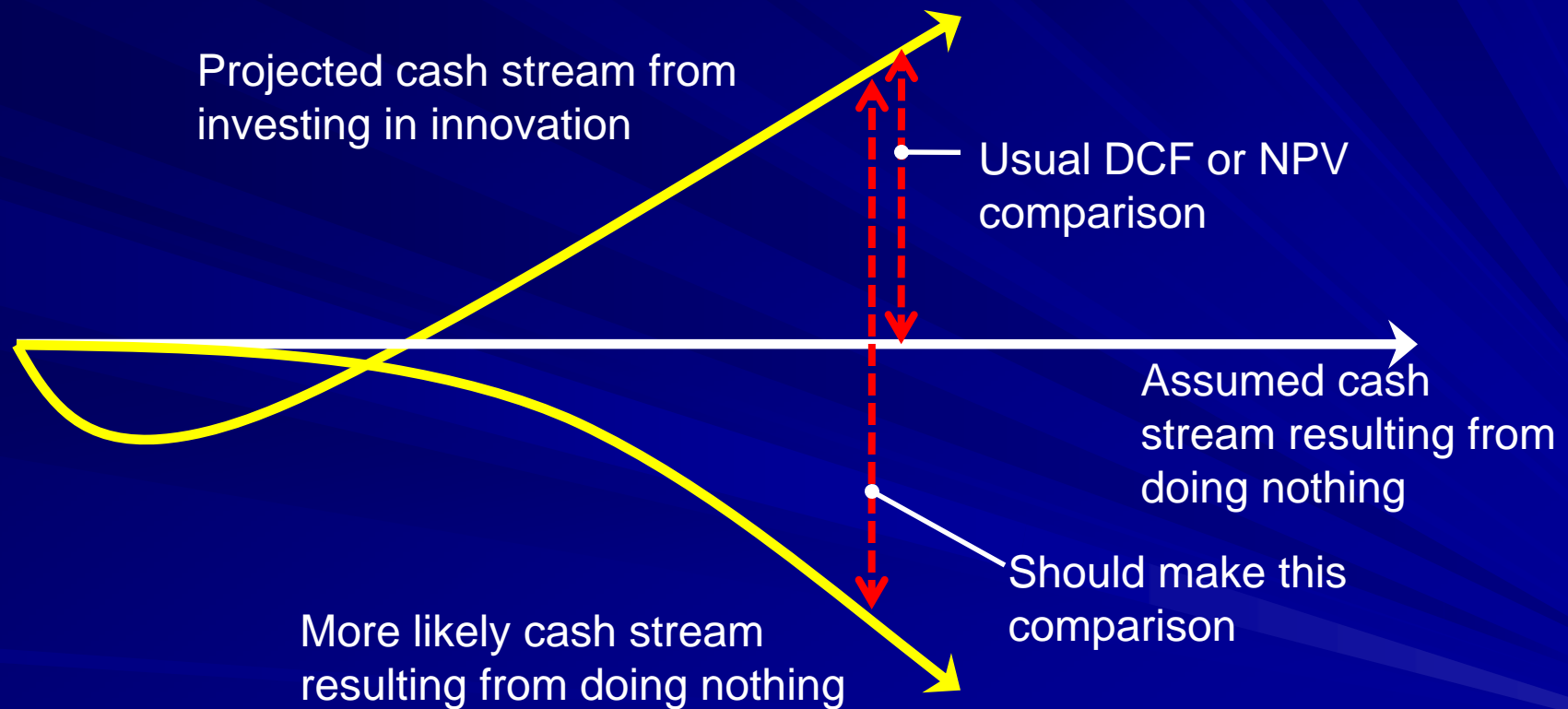
Laggard Insurance



Luminary Mutual



The Discounted Cash Flow Trap



Source: Christensen, Kaufmann, Shih, "Innovation Killers: How Financial Tools Destroy Your Capacity to Do New Things", Harvard Business Review, Jan 2008 ¹⁹

Calculating NPV

Laggard Insurance *"Do Nothing"*

Year	Profit
0	\$240
1	-\$160
2	\$54
3	\$100
NPV	\$207

Luminary Mutual *"Invest in Segmentation"*

Year	Profit
0	\$240
1	\$200
2	\$280
3	\$380
NPV	\$875

NPV Calculated using a 15% Discount Rate

Calculating NPV

Considering Marginal Costs

Laggard Insurance
“Do Nothing”

Year	Profit
0	\$240
1	-\$160
2	\$54
3	\$100
NPV	\$207

Luminary Mutual
“Invest in Segmentation”

Year	Profit	Marginal Costs	Net Profit
0	\$240	\$100	\$140
1	\$200	\$20	\$180
2	\$280	\$25	\$255
3	\$380	\$25	\$355
NPV		NPV	\$723

NPV of “Status Quo” Scenario = \$788

NPV Calculated using a 15% Discount Rate

Measuring Value

- Assessing the Value of Segmentation
 - Requires understanding of marketplace dynamics
 - Requires projections of revenue, retention, and conversion effects
- Basis of comparison is not “status quo”
 - Project the “do nothing” scenario as well

Relaxing the Assumptions

■ Pricing

- What if Laggard tried to compete by lowering profit expectations?

■ New Scenario

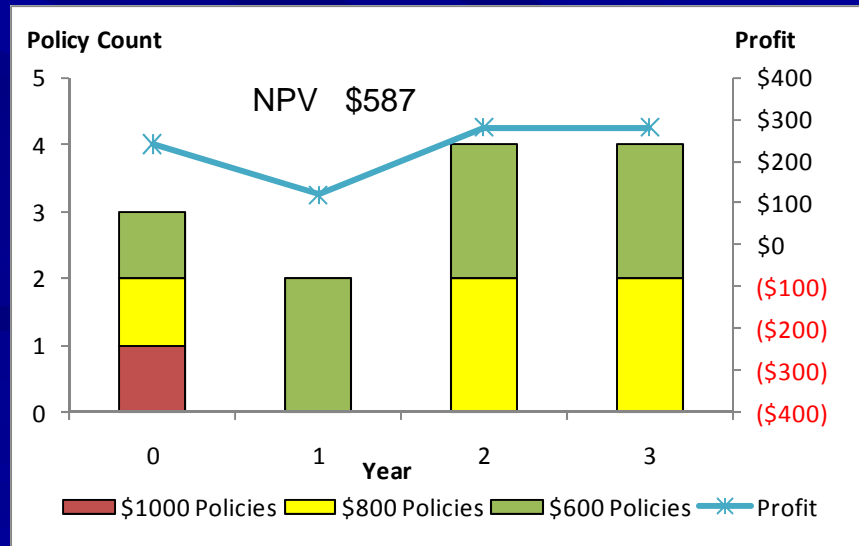
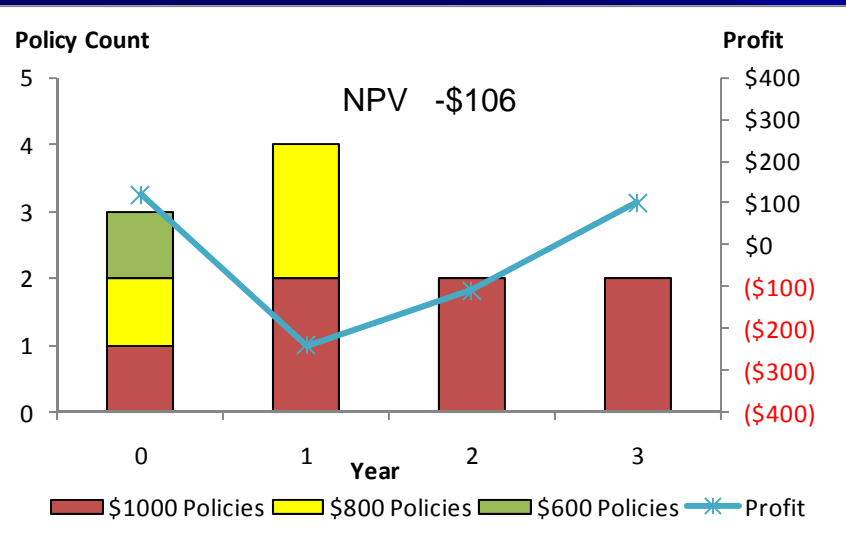
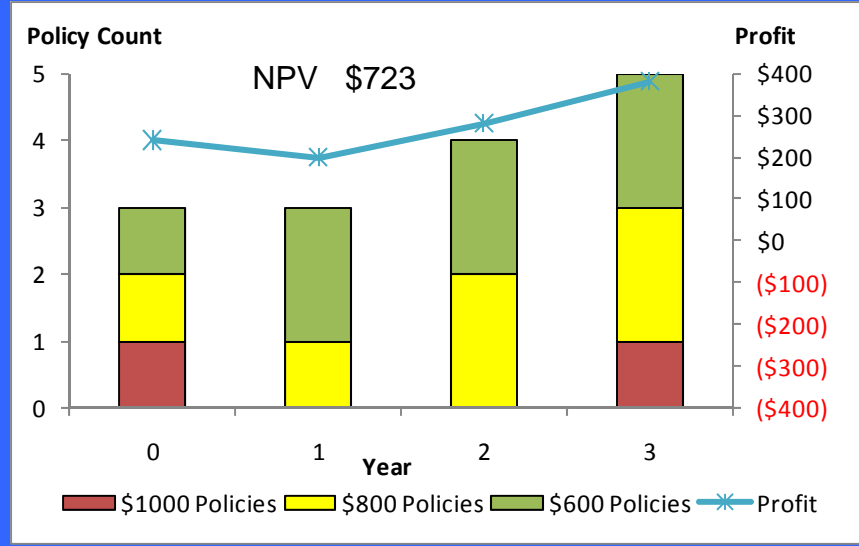
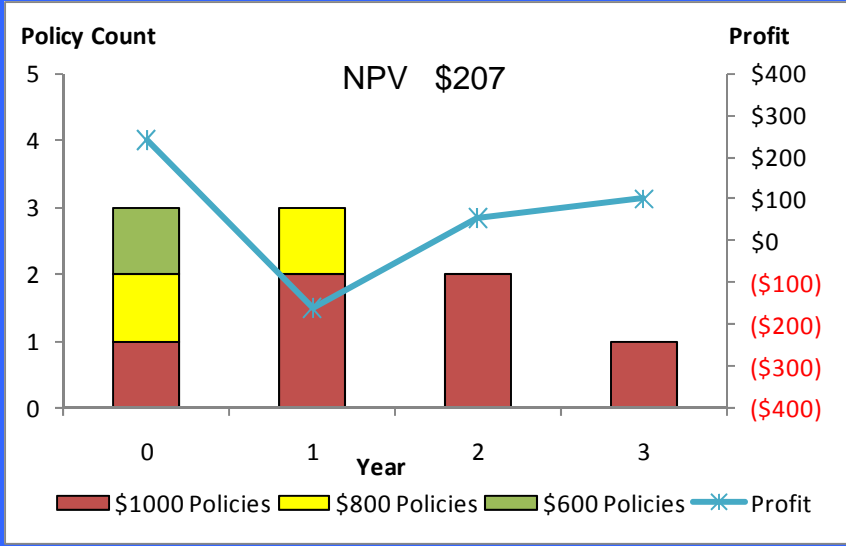
- Laggard uses 5% profit provision
- Luminary keeps 10% profit provision

Competing on Profit Provision

Laggard Insurance

Luminary Mutual

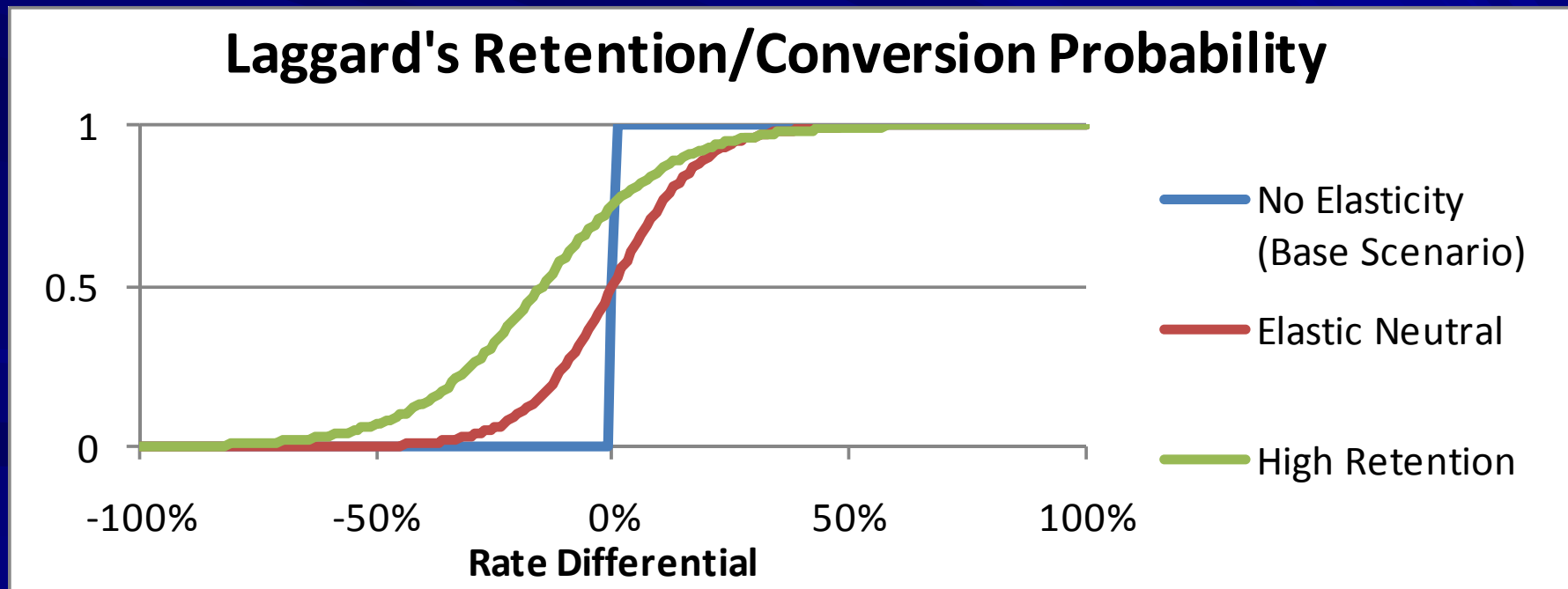
Base Scenario



Relaxing the Assumptions

■ Retention/Conversion

- Assume some policies will stay with current insurer despite price differences

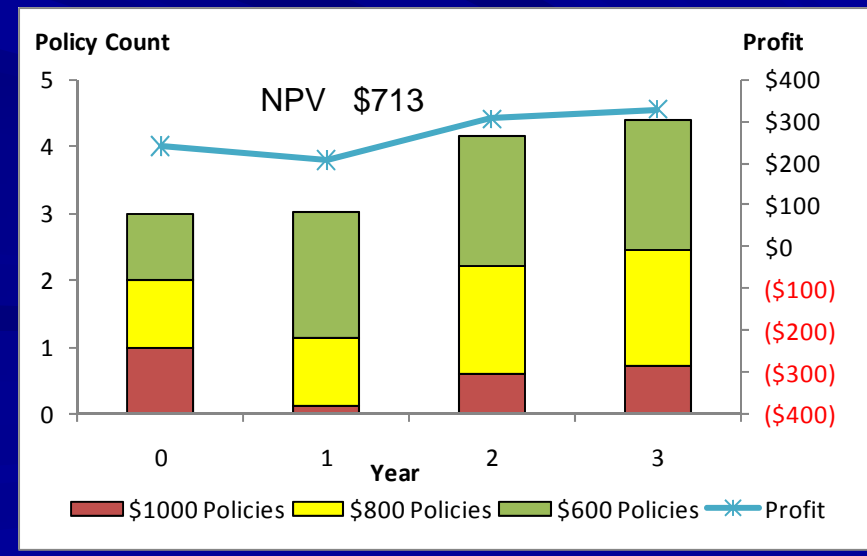
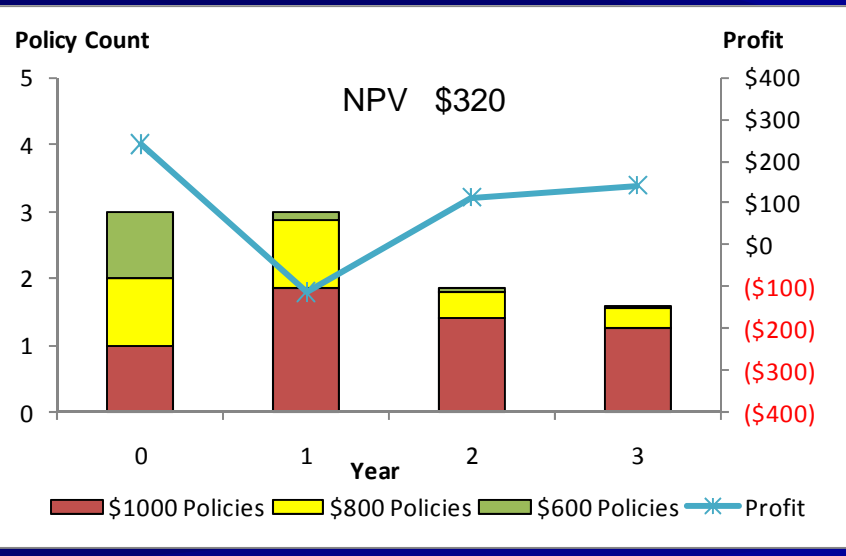
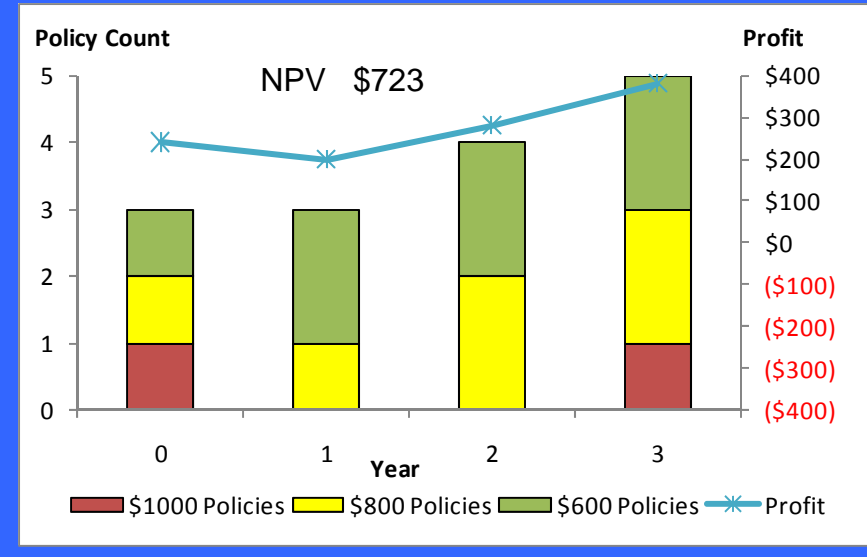
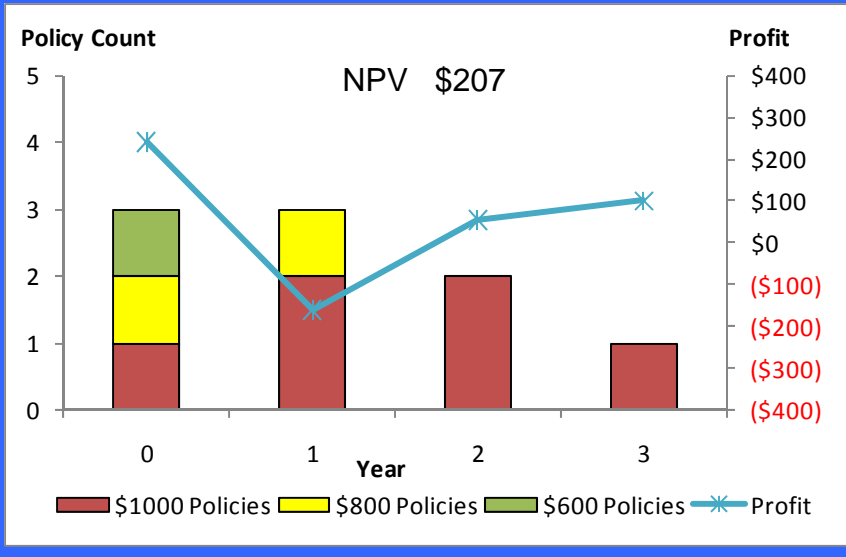


Neutral Price Elasticity

Laggard Insurance

Luminary Mutual

Base Scenario

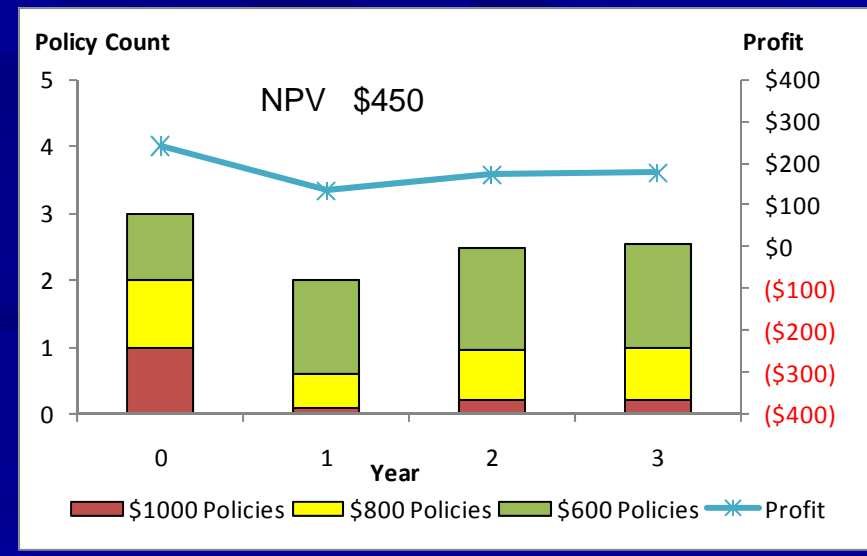
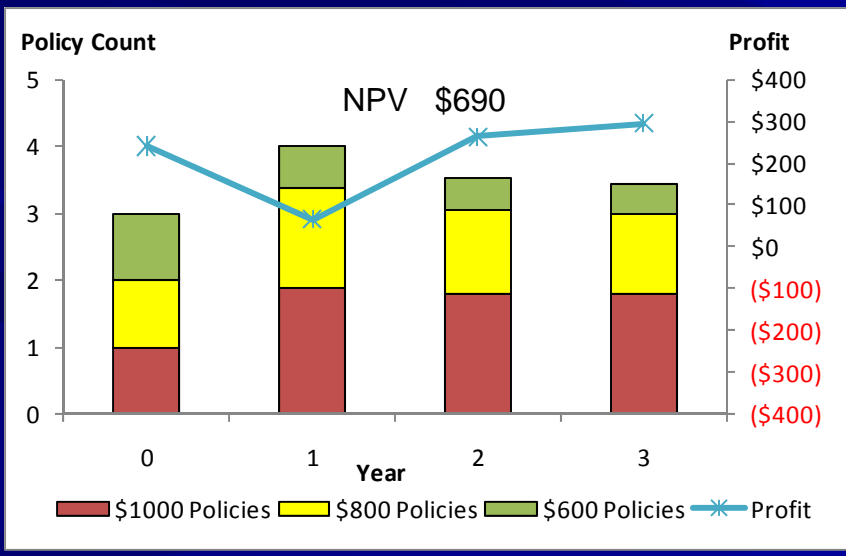
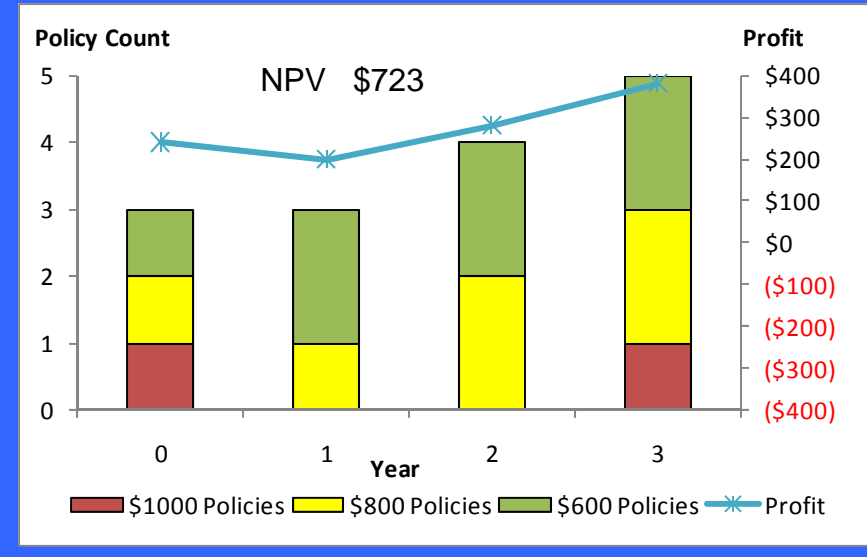
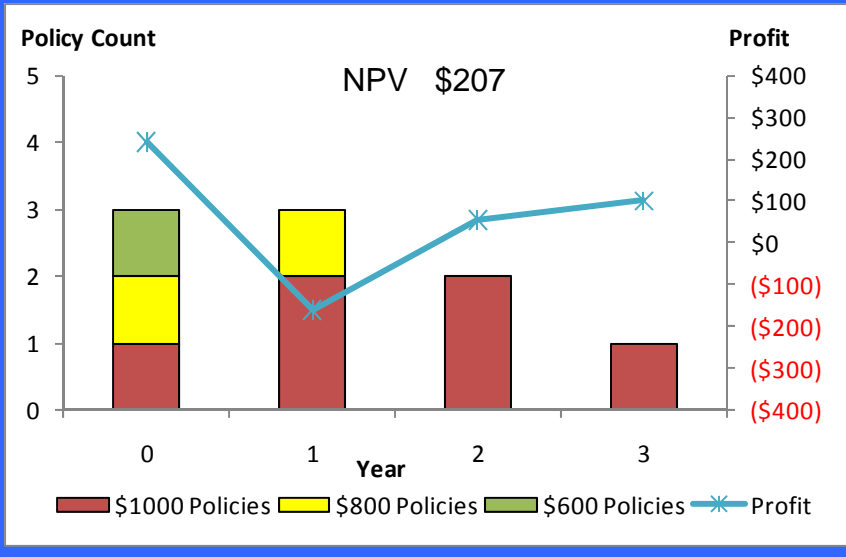


High Retention Price Elasticity

Laggard Insurance

Luminary Mutual

Base Scenario



Further Extensions

- Include multiple entities
- Refinement of conversion/retention effects in a competitive marketplace
- More sophisticated pricing implementation strategies
- Projections are inherently uncertain
 - Use stochastic simulation to project future scenarios under uncertainty
 - Connection with Strategic Risk Management