

## Experiments in Managerial Accounting (or Welcome to the Island of Misfit Toys)

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## Let's get this out of the way

- What is accounting?
  - Measurement or Control or Both
  - Not just financial reporting
- Two roles of management accounting
  - Decision facilitating
  - Decision influencing

## An approach

- Start with the economics – basic games
- Apply it in an accounting setting
  - Our analytic friends have often done this work for us
- How can my understanding of psychology / actual behavior supplement this understanding?
- What new insights do I gain?

## An Ultimatum Game

- Player A gets an endowment of \$10
- Player A decides how much of the \$10 to offer Player B and how much to keep
- Player B decides whether or not to accept the offer.
  - If accepted, B gets the offer and A gets the rest
  - If rejected, neither gets anything
- Basic economic prediction
- Results

## A little change

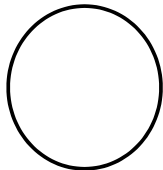
- A gets an endowment of \$X, where X is known to A but not B
- Everything else is the same
- Basic economic prediction
- Result
- What accounting setting does this remind you of?

## Consider this setting

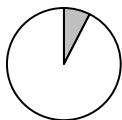
- A project will create revenue of \$7,000
- Funding needed to complete project:
  - { \$4,000, 4,050, 4,100 . . . \$6,000 }
  - IMPORTANT – Division manager can't affect funding needs
- Other costs of project = \$1,000
- Division Manager knows funding needs, CEO doesn't.
- How does the CEO decide?
  - Whether to conduct the project?
  - How much to fund

## Participatory Budgeting

- Let's go to the analytics
  - Antle & Eppen (*Management Science* 1985)
  - Set a hurdle (\$5,500)



No Hurdle Contract



Hurdle Contract

## A Few Assumptions

- CEOs can effectively commit to the hurdle
- Division managers don't mind lying
- Division managers don't care if they look like liars

## Questioning the assumptions: What if division managers don't like to lie?

- Evans et al. 2001 (*TAR* 2001)
  - DMs sacrifice wealth to make honest or partially honest reports (they don't maximize slack)
  - They don't lie more as the payoff to lying increases.
  - Hurdle contract earns
    - more profit than a trust contract
    - less profit than a modified trust contract

## Questioning the Assumptions: What about Commitment?

- CEO must commit to the hurdle contract, and stick to that commitment, even when both the CEO and the Division Manager prefer to renegotiate.

## Questioning the Assumptions: What about Commitment?

- Rankin et al. (*JMAR* 2003)
  - CEOs often bluff
  - Division managers fall for the bluff
  - Firms earn almost as much profit with non-binding hurdle as with hurdle contract

## Back to the analytics

- Antle & Fellingham (*JAR* 1995)
  - If an information system is available, use it to set the hurdle.

### Consider this information system

- Imprecise (doesn't give exact cost, but tells which quartile costs are in)
- Inaccurate (only correct 70% of the time)

### Effects of Information System

Hurdle Contract with No Information System      Hurdle Contract with Information System

### Questioning the Assumptions: What if division managers want to make a positive impression?

- Hannan et al. (CAR 2006)
  - Division managers trade off slack vs. positive impression
  - Information system can reduce slack, even if it isn't used in a hurdle contract.
  - Optimal use of information system depends on its precision
    - More coarse – no hurdle contract
    - More precise – hurdle contract

### Ripe for the Picking

- Optimal contracting weights
- Different types of performance measures
  - Relative vs. absolute
  - Financial vs. non-financial
  - Objective vs. Subjective
  - Forward-looking vs. Contemporaneous
- Contracting with teams
  - Effects of competition, mutual monitoring, free-riding
- Supply chain issues – controlling across firm boundaries

### Fruitful approaches to “experimenting with analytics”

- Are the assumptions correct?
  - If not, how does it affect the result?
- Are there multiple equilibria?
- Are there other solution concepts?
- Are there process issues?

### Are there multiple equilibria?

		Player 2	
		<i>l</i>	<i>r</i>
Player 1	<i>u</i>	3, 2	0, 0
<i>d</i>		0, 0	2, 3

Are there other solution concepts?

		<b>Player 2</b>	
		<i>l</i>	<i>r</i>
<b>Player 1</b>	<i>u</i>	3, 3	0, 5
	<i>d</i>	5, 0	1, 1

Less fruitful approaches to “experimenting with analytics”

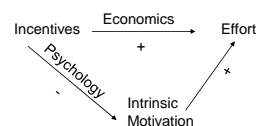
- Testing the model (with no reason for questioning it)
- Horse race

Testing the model (with no reason for questioning it)

		<b>Player 2</b>	
		<i>l</i>	<i>r</i>
<b>Player 1</b>	<i>u</i>	20, 5	10, 2
	<i>d</i>	2, 10	5, 20

A Note on Horse Races

- Economics predicts X
- Psychology predicts Y
- Which is right?
- Implicit Assumption?



Practically speaking

- Take a “math for economists” class
- Take a microeconomics class
- Take a game theory class
- Books
  - Game Theory for Applied Economists (Robert Gibbons)
  - Games and Information (Eric Rasmusen)
  - Games of Strategy (Avinash Dixit and Susan Skeath)
  - Economics, Organization & Management (Paul Milgrom and John Roberts)

Historically – Two Styles of Experiments

- Decision Facilitating Role
  - Experimental Psychology approach
    - Based in psychology literature
    - Context-Rich scenario
    - Flat pay for participation
    - Focus on processes
- Decision Influencing Role
  - Experimental economics approach
    - Based in economics literature
    - Context-free scenario
    - Pay depends on decisions
    - Focus on outcomes
- But . . . Hybrids can take the best of both!