

# **Decision-Making in Organizations: Pricing, Politics, and Path-Dependence**

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*Preliminary and Incomplete!*

# This talk is ...

- Not an article, not a survey
- “Field-view”
  - *Ann. Rev. Econ.* (Jul. 08)
  - Nobel Symposium (Aug. 08)
  - PUP (Jul. 09)

⇒ % economists?

% organizational economists?

# Outline

## I. Pricing

- Pigou: (Try to) Get prices right

## II. Politics

- March: Manage internal coalition

## III. Path-Dependence

- Winter: Routines are home-grown

# Outline

## I. Pricing 1/3

- Pigou: (Try to) Get prices right

## II. Politics 1/3

- March: Manage internal coalition

## III. Path-Dependence 1/3

- Winter: Routines are home-grown

# I. Pricing

- 1-3 (& 4)

# II. Politics

- (1-3 &) 4

# III. Path-Dep.

- (1-4 &) 5

1. Formal is flawed
2. Relational is required
3. Formal and relational interact
4. Institutional design
5. Building & changing relationships

# 1. Formal Is Flawed

Free-Lunch Challenge:

Find an *employee* with *fabulous* incentives created *solely* by a *formula*.

- Employee vs. outsourcing
- Fabulous vs. acceptable
- Solely vs. partially
- Formula vs. subjective

What are formal instruments?

Why are they flawed?

# I. Pricing: The Incentive-Systems / Pigouvian Approach

- What makes a good performance measure?
  - multi-task (HM 91, Baker 92)
  - $\cos(\theta)$  (Feltham-Xie 94, Datar-Kulp-Lambert 01, Baker 02)
  - risk-neutrality, no mechanism design
- What to do if performance measure is poor?
  - theory of the second best / envelope theorem

Details & references in Gibbons, “Incentives Between Firms (and Within),” *Management Science* 2005.

# $\cos(\theta)$

- $y = f_1 a_1 + f_2 a_2$  non-contractible
- $p = g_1 a_1 + g_2 a_2$  contractible
- $\pi = y - w$
- $U = w - c(a_1, a_2)$
- $c = (1/2)(a_1^2 + a_2^2)$
- $w = s + bp$

# cos( $\theta$ )

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- $c = (1/2)(a_1^2 + a_2^2)$
- $w = s + bp$

## GWYPF

Kerr 75:

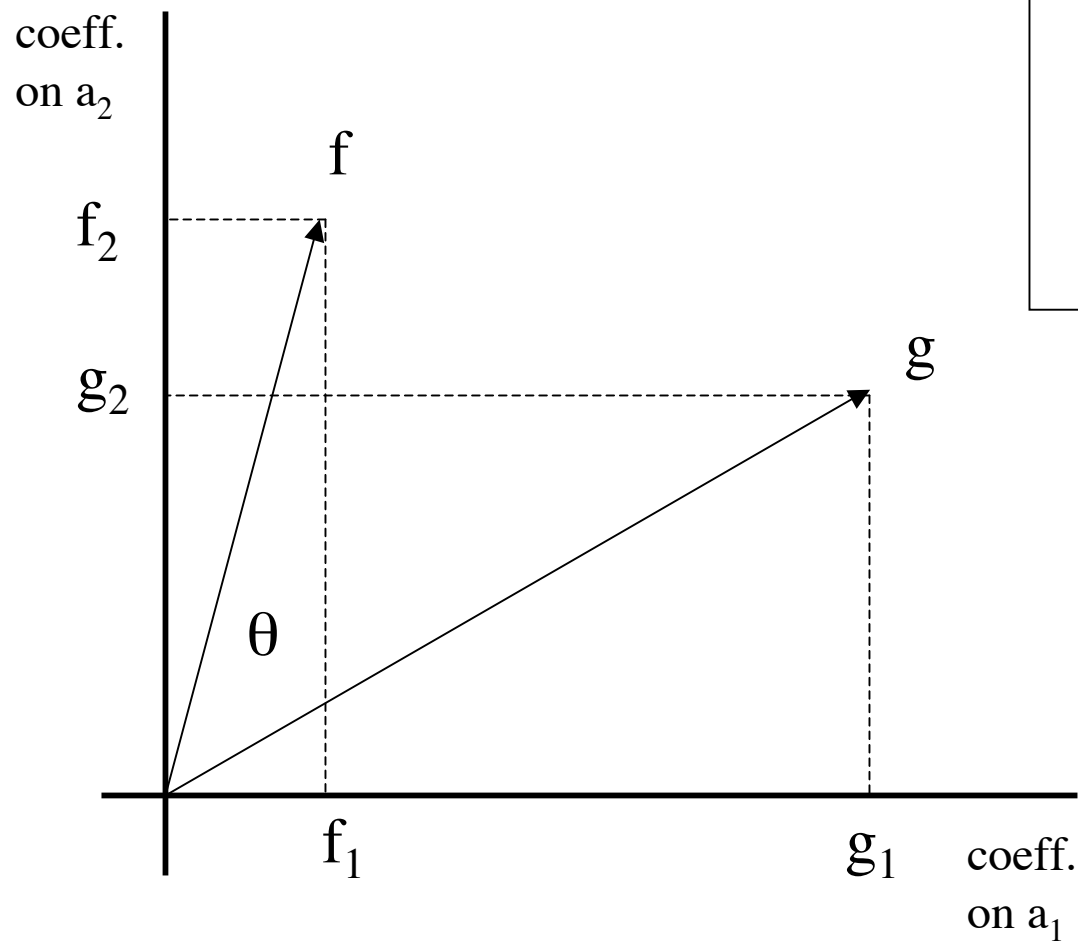
“On the Folly ...”

Paying for p:

$\Rightarrow p \uparrow$

$\Rightarrow y \uparrow ?$

# Optimal slope (for distortionary performance measure)



$$b^* = \frac{\|f\|}{\|g\|} \cos(\theta)$$

# What to do if (because) $p$ is poor?

- Job design (HM 91)
- Asset ownership (HM 91)
- Relational contract (BGM 94)
- ...

# Asset Ownership

- $y =$  output value                      non-contractible
- $p =$  perf. meas.                              contractible
- $v =$  asset value                              non-contractible
  
- P owns asset  $\rightarrow$  A = employee
  - P:  $y + v - w_E(p)$       A:  $w_E(p) - c(a)$
  
- A owns asset  $\rightarrow$  A = indep. contractor
  - P:  $y - w_C(p)$               A:  $w_C(p) + v - c(a)$

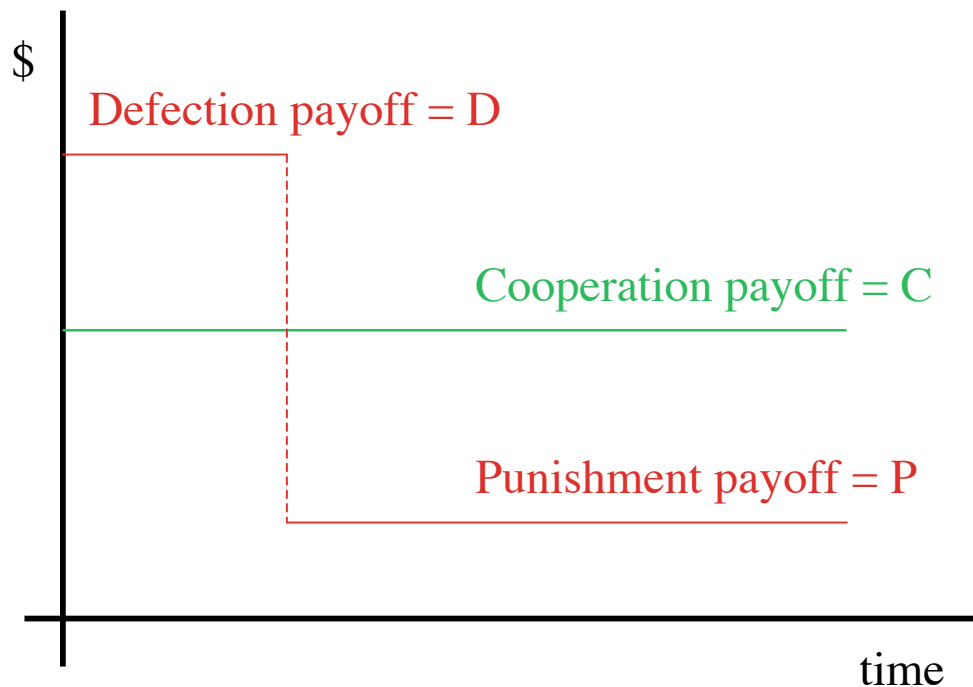
- Example 1:
  - $y = a_1 + \varepsilon, \quad v = a_2 + \xi, \quad p = a_1 + a_2 + \phi$
  - $b_E^* = 1 \rightarrow \text{FB}$
- Example 2:
  - $y = a_1 + \varepsilon, \quad v = a_2 + \xi, \quad p = a_1 + \phi$
  - $b_C^* = 1 \rightarrow \text{FB}$
- Formal still flawed (except knife-edges)
- Future reference:  $\theta$  small  $\rightarrow$  “outsource”  
(*cf.* FLC & Leamer)

## 2. Relational Is Required

“Cooperation” = desired adaptation

“Defection” = opportunistic adaptation

“Punishment” = “adversarial behaviors”



“... good-faith efforts to ... create cooperative project organisations that ... enable rapid adaptation to unforeseen events, both adverse and beneficial.”

“Misaligned actions and behaviors on either side could undermine the intrinsic value of the strategy through reversion to ‘adversarial’ contract management behaviors.”

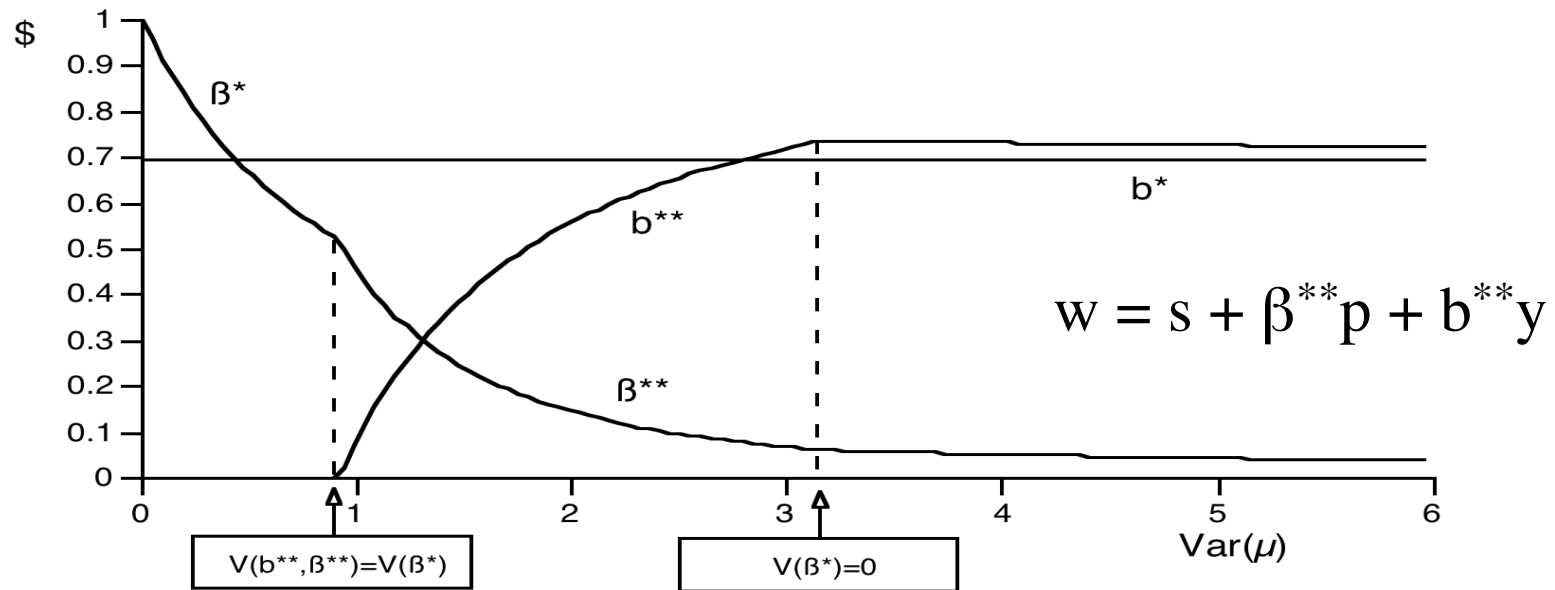
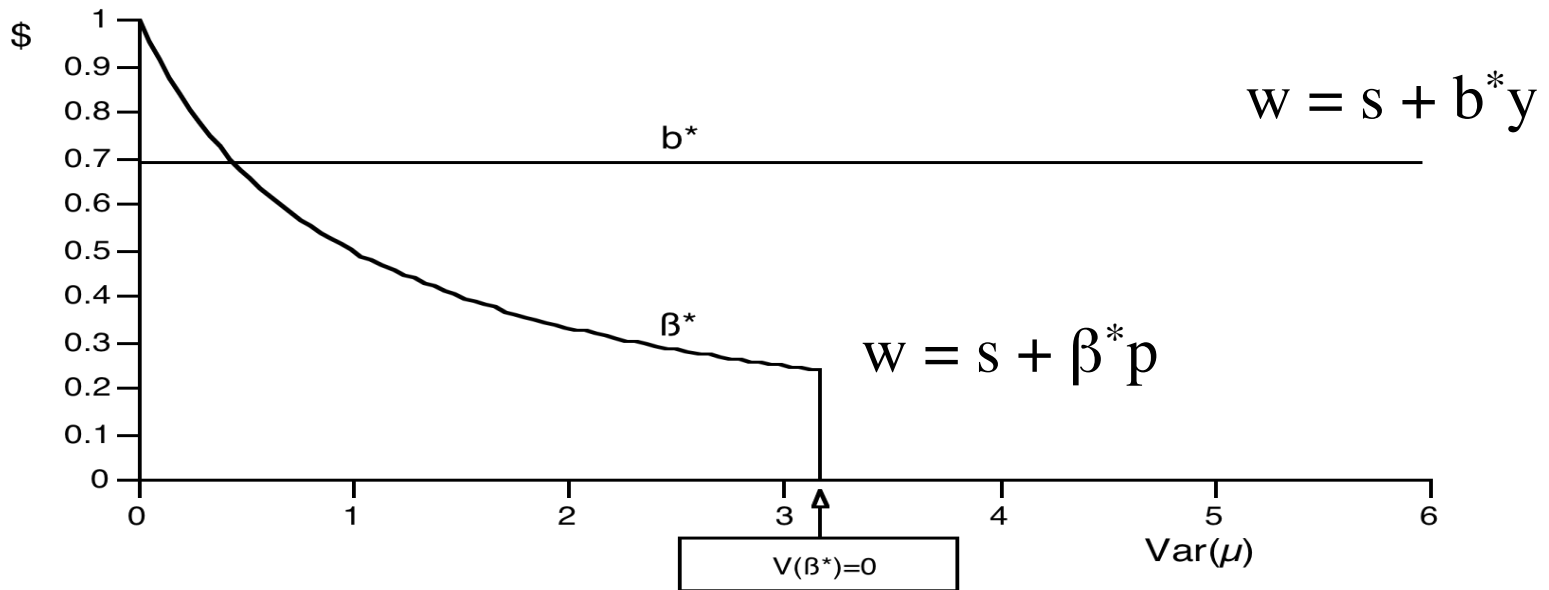
Bull 87, MM 89, Levin 03

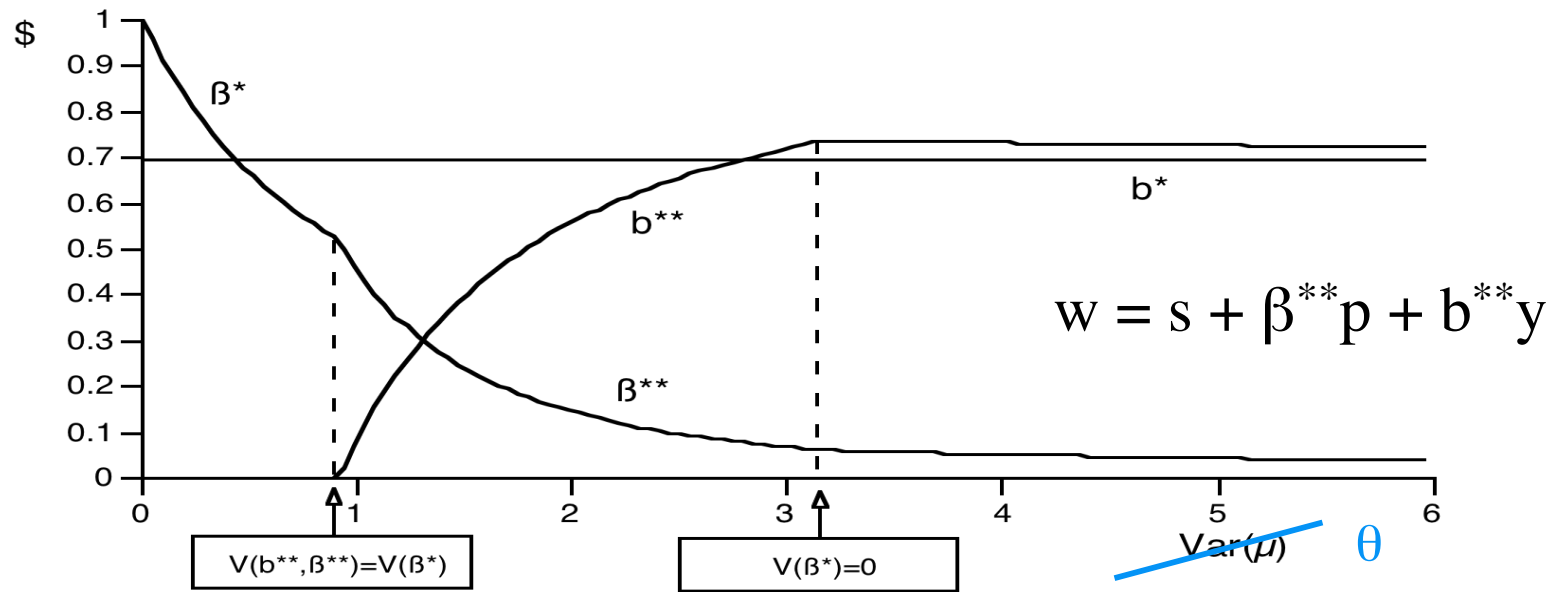
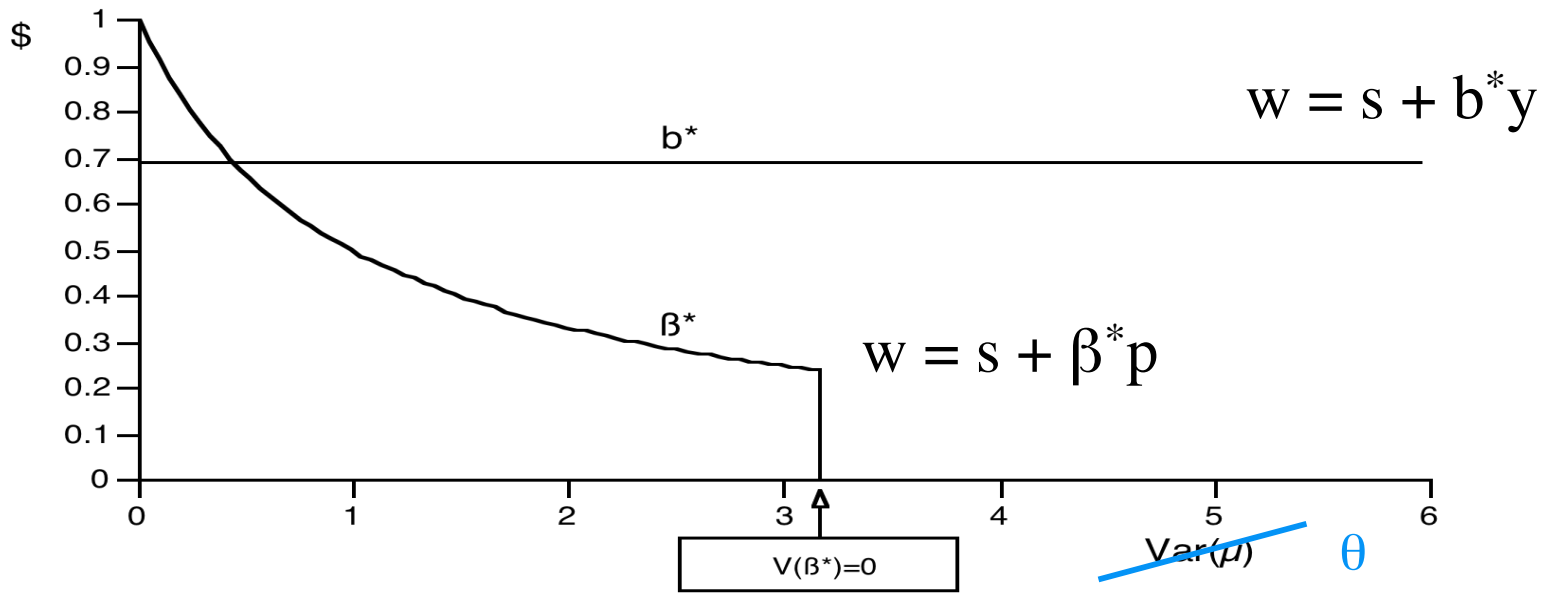
“Most exchanges take place within the context of long-term relationships that create the *language* needed for buyer and seller to communicate, that establish the *trust* needed to carry out the exchange, that allow ongoing servicing of *implicit or explicit guarantees*, that *monitor* the truthfulness of both parties, and that *punish* those who mislead.” (Leamer, 2007; emphasis added)

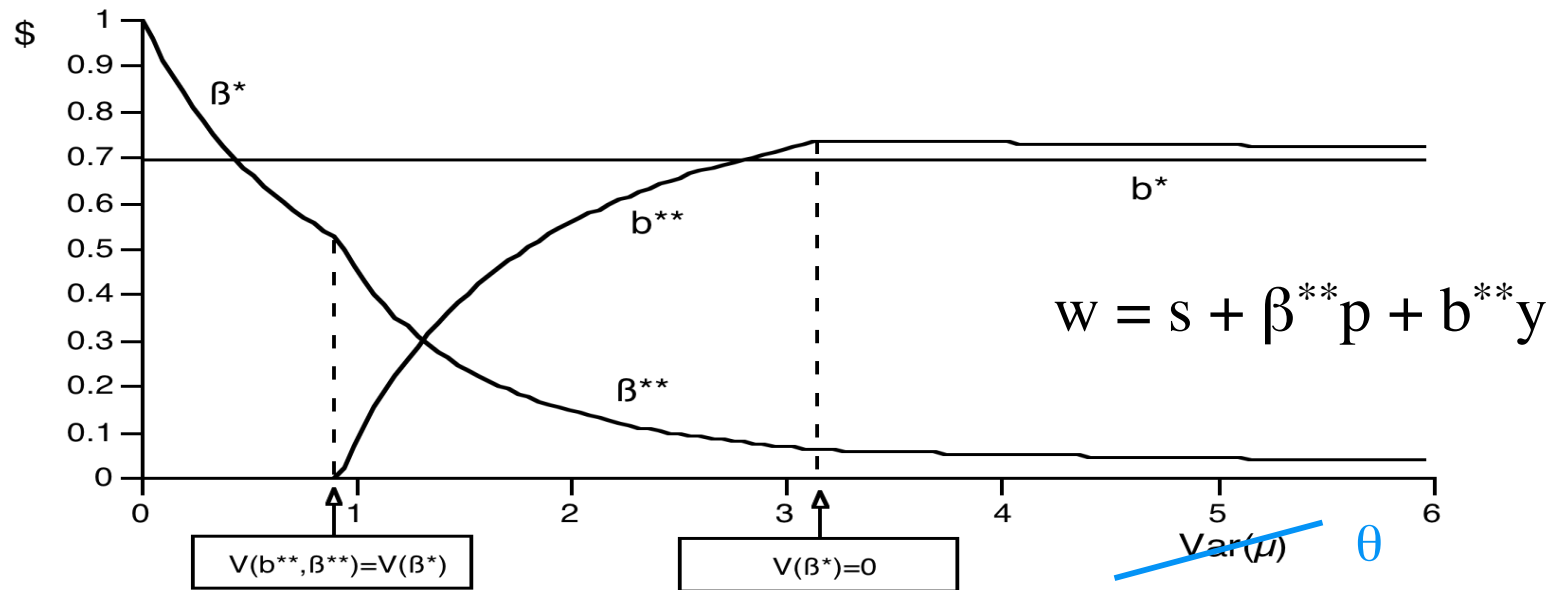
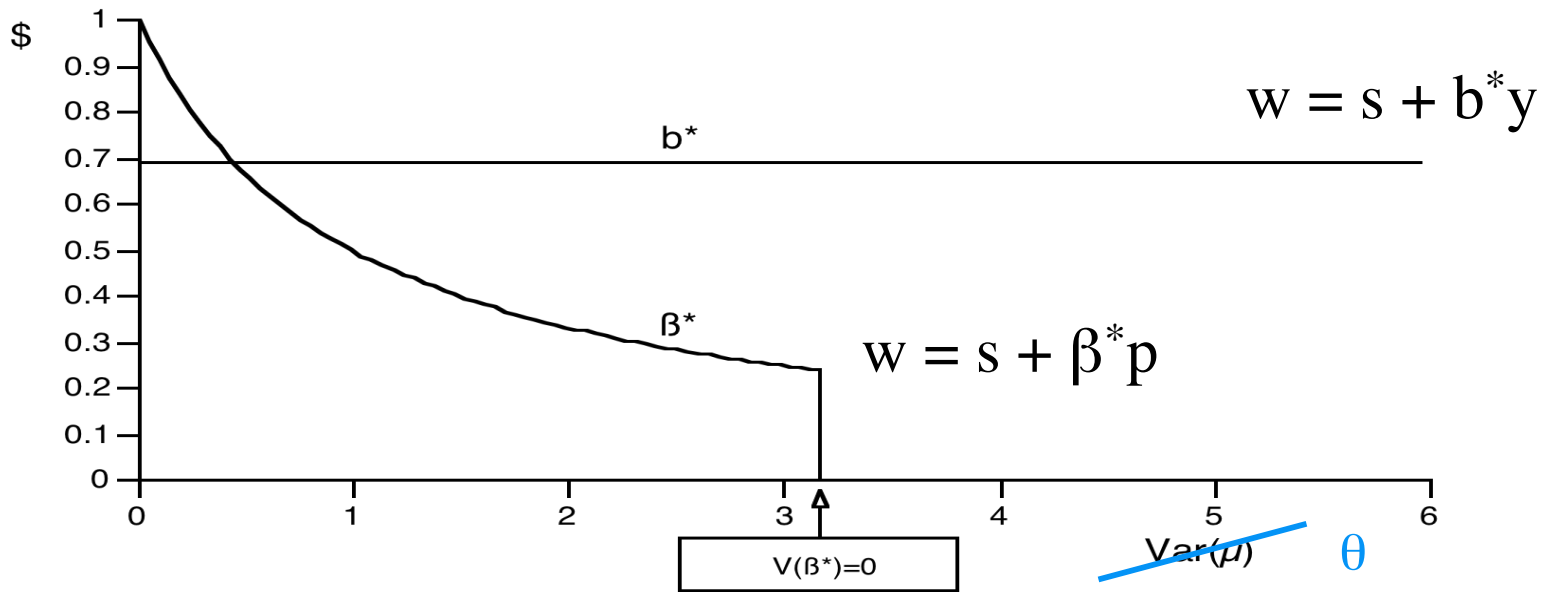
# 3. Formal and Relational Interact

(example: Baker, Gibbons, & Murphy *QJE* 94)

- Objective & subjective performance measures
  - $p$  = verifiable but distortionary [  $\text{var}(\mu) \sim \theta$  ]
  - $y$  = observable but not verifiable
- Incentive contracts
  - $W = s + \beta p$  piece rate (Baker *JPE* 92)
  - $W = s + by$  subjective bonus (Bull *QJE* 87)
  - $W = s + \beta p + by$  combination (Lincoln Electric)







crowding

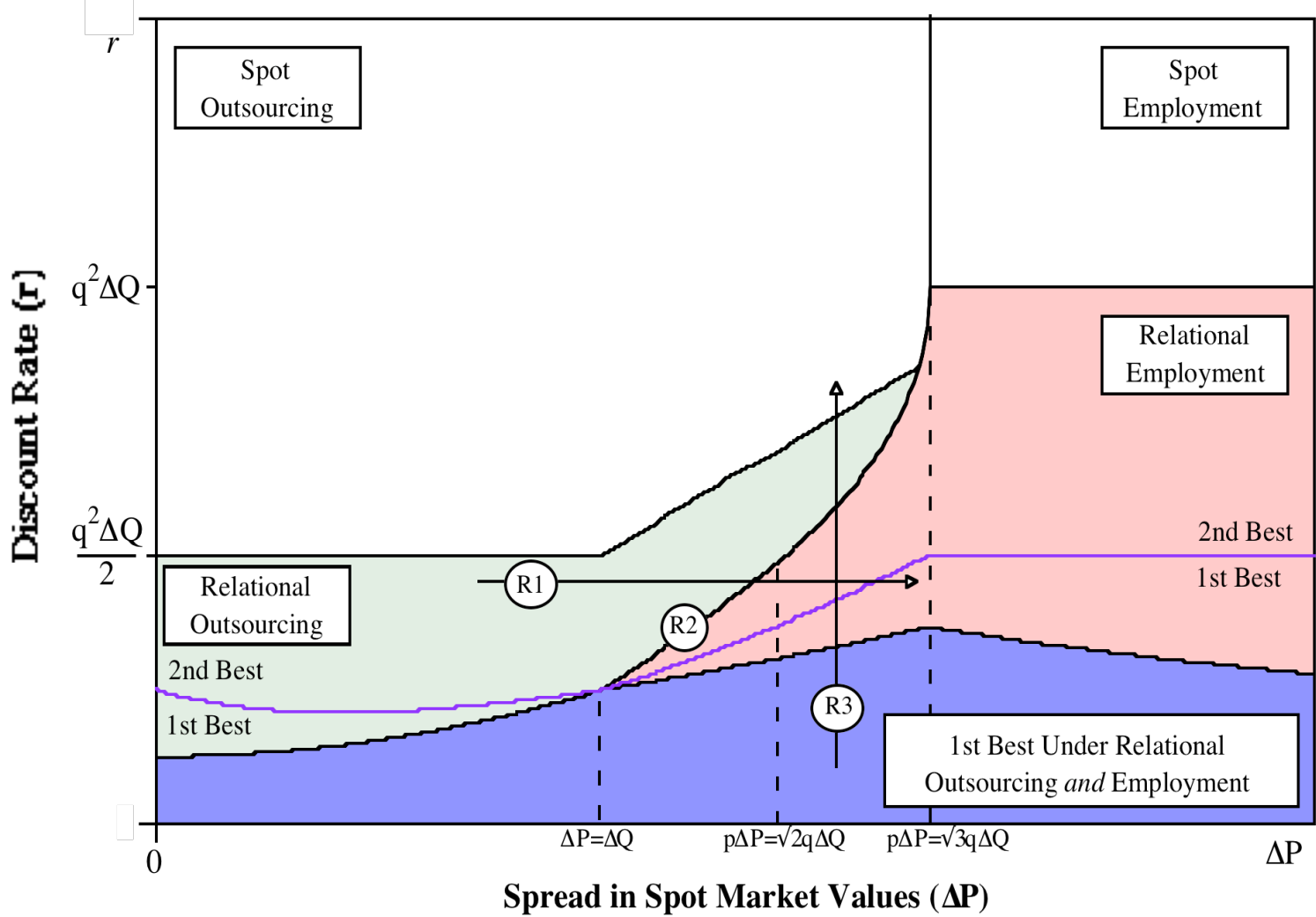
substitutes

complements

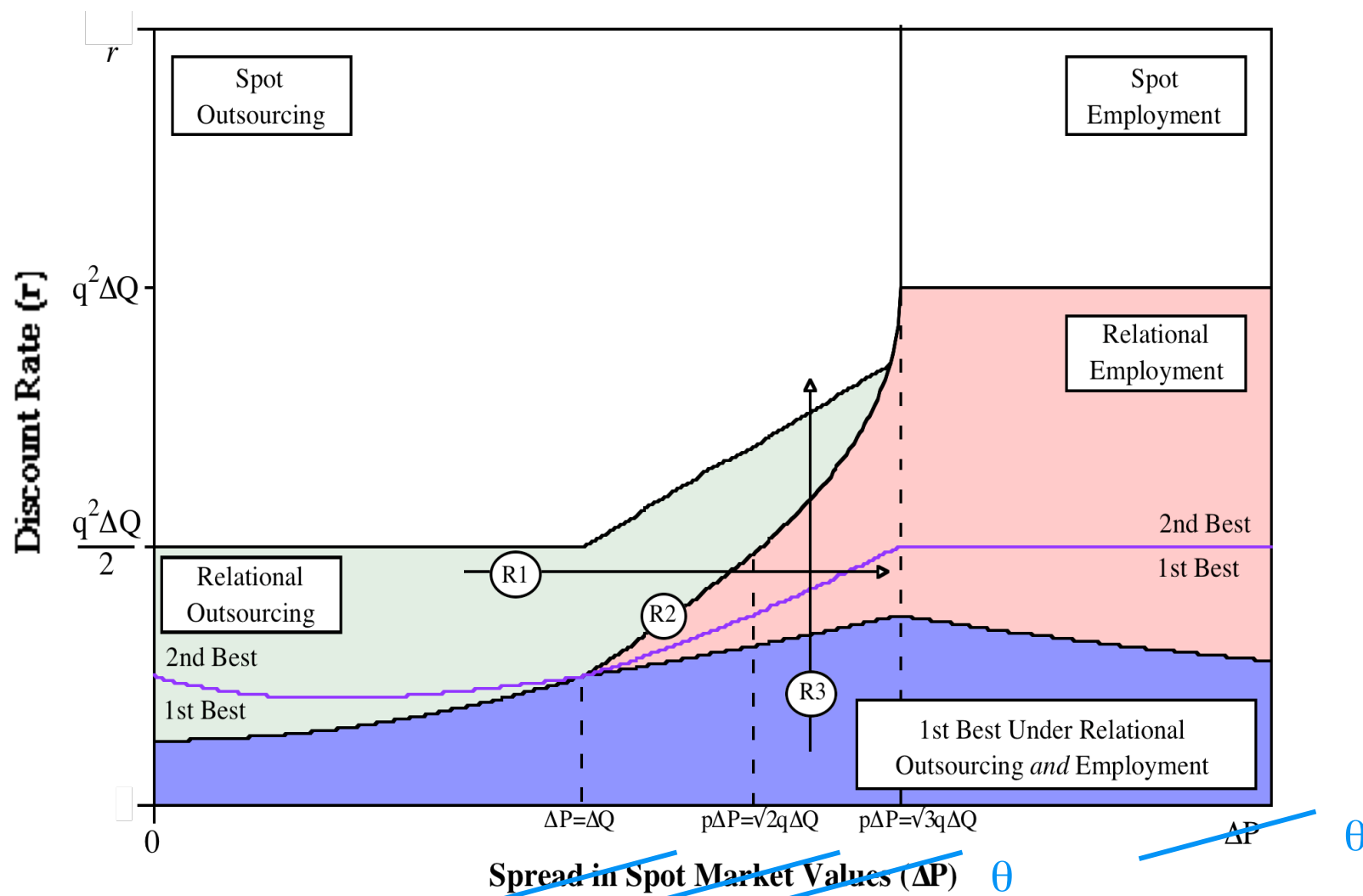
# I. Pricing: Summary

- Some “prices” can be chosen ( $b$ ), but not for the right things ( $\theta$ )
- Indirect “prices” also exist ( $v$ ), but still not perfect
- Relationships help (but *still* not perfect?)
- $(y, p, v, r) \Rightarrow$  Coasian Horserace
  - *e.g.*, firms have low-powered incentives *on purpose* (Holmstrom 99)

# Coasian Horseshoe



# Coasian Horseshoe



# I. Pricing: Critique

- Too much pricing!
  - NB: bargaining is pricing (GHM)
- Not enough “politics”
  - Structure of control (authority)
  - Battles for control (rent-seeking)
  - Anticipation of control (influence)
  - Exercise of control (empowerment)

# I. Pricing

- 1-3 (& 4)

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# “Politics” in Organization Theory

March (1962): “The Business Firm as a Political Coalition”

“We have argued that the business firm is basically a coalition without a generally shared, consistent set of goals. Consequently, we cannot assume that a rational manager can treat the organization as a simple instrument in his dealings with the external world. Just as he needs to predict and attempt to manipulate the ‘external’ environment, *he must predict and attempt to manipulate his own firm.*” (Cyert & March, 1963)

“To understand organizational choices using a political model, it is necessary to understand who participates in decision making, what determines each player’s stand on the issues, what determines each actor’s relative power, and *how the decision process arrives at a decision.*” (Pfeffer, 1981).

“The kinds of models presented in this book provide another possible alternative descriptive view of an organization. *We can describe the organization as a decision-making process.*” (Cyert & March, 1963)

# What Is a “Decision Process?”

- Pricing?
- Bargaining?
- Voting?
- Committee?
- Agenda?
- Dictatorship?
- Authority?
- Lobbying?
- Rent-Seeking?
- Coalition?
- Empowerment?
- Social movement?

## II. The Politics of Control (*i.e.*, Non-Contractible Decisions)

### *Consequences of control:*

Communication	Crawford-Sobel <i>Ecta</i> 82
Lobbying	Milgrom-Roberts <i>AJS</i> 88
Initiative	Aghion-Tirole <i>JPE</i> 97 ( <i>cf.</i> GHM)

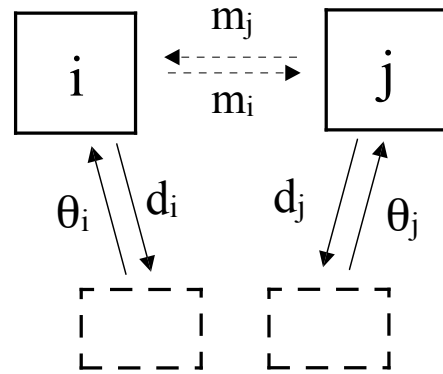
### *Battle for control:*

Rent-Seeking	Tullock 80, Skaperdas <i>AER</i> 92
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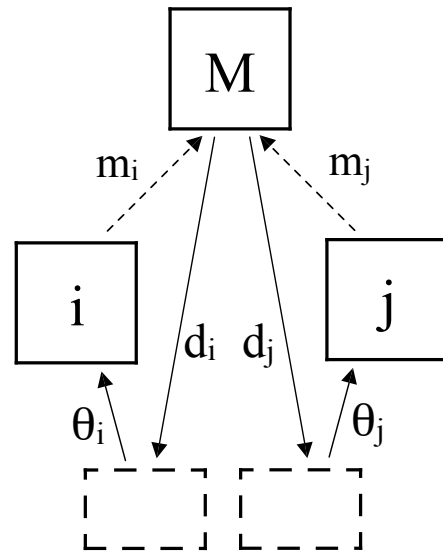
### *Allocation of control:*

Adaptation	Dessein <i>RES</i> 02, ADM <i>AER</i> 08, Rantakari 08
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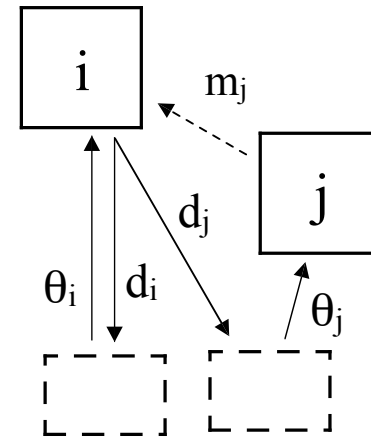
Alonso, Dessein, & Matouschek  
*AER* 08: symmetric divisions



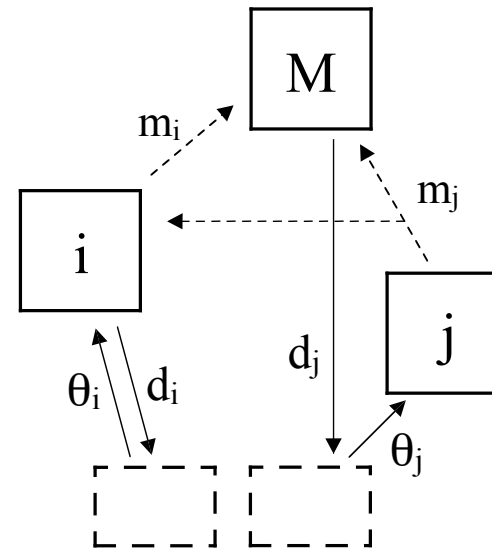
(A) Decentralized Authority



(B) Centralized Authority

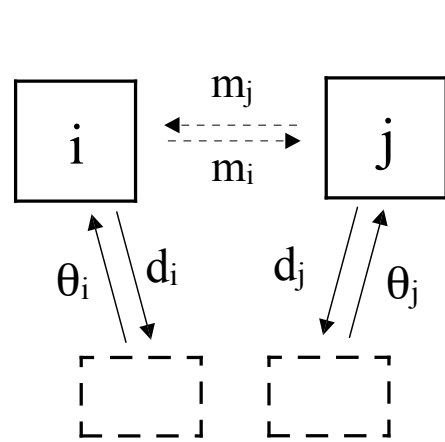


(C) Directional Authority

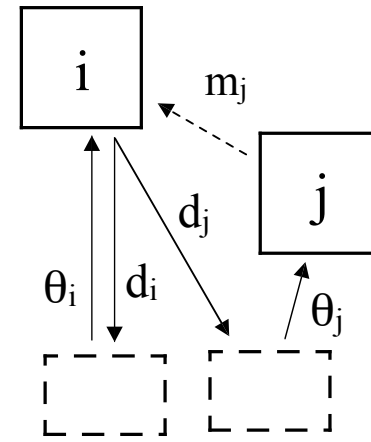


(D) Partial Centralization

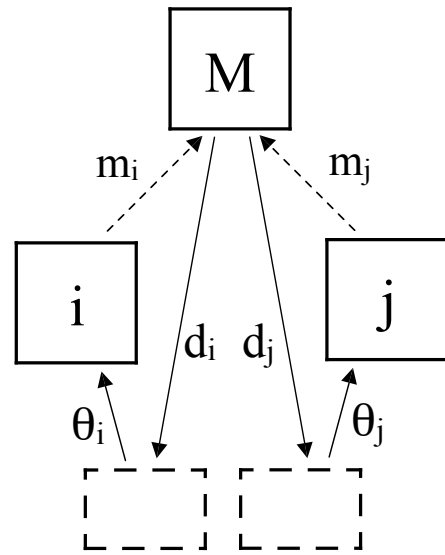
Rantakari 08: symmetric structures optimal only for roughly symmetric divisions; asymmetric structures for asymmetric divisions (eg, IBM PC or Microsoft Explorer?)



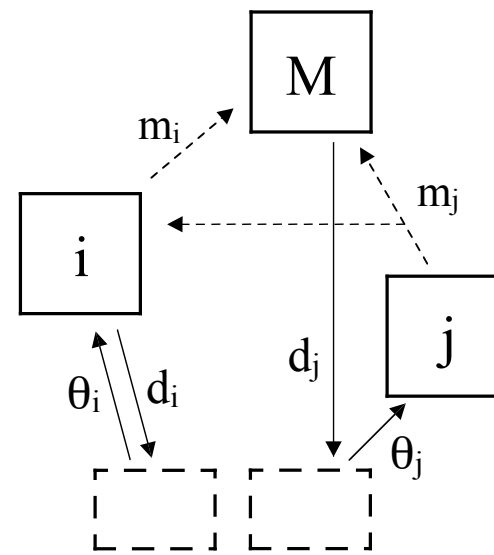
(A) Decentralized Authority



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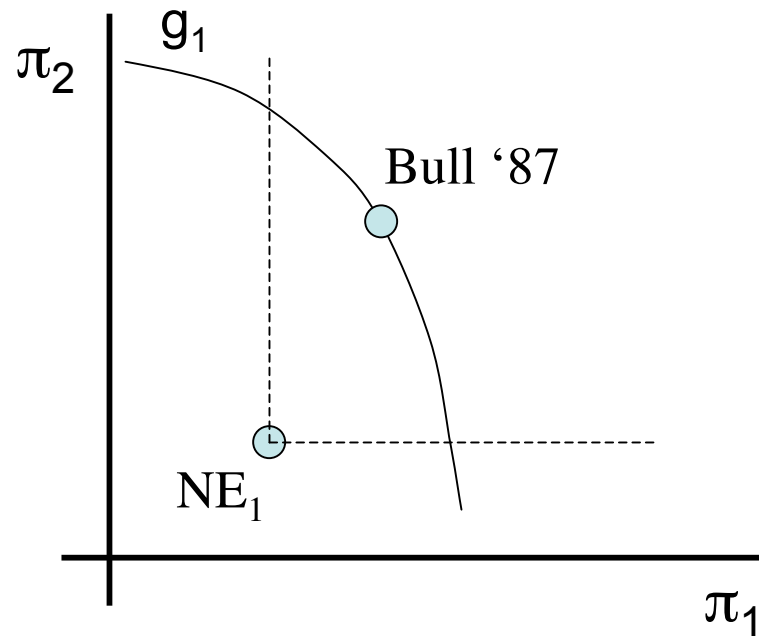


(B) Centralized Authority

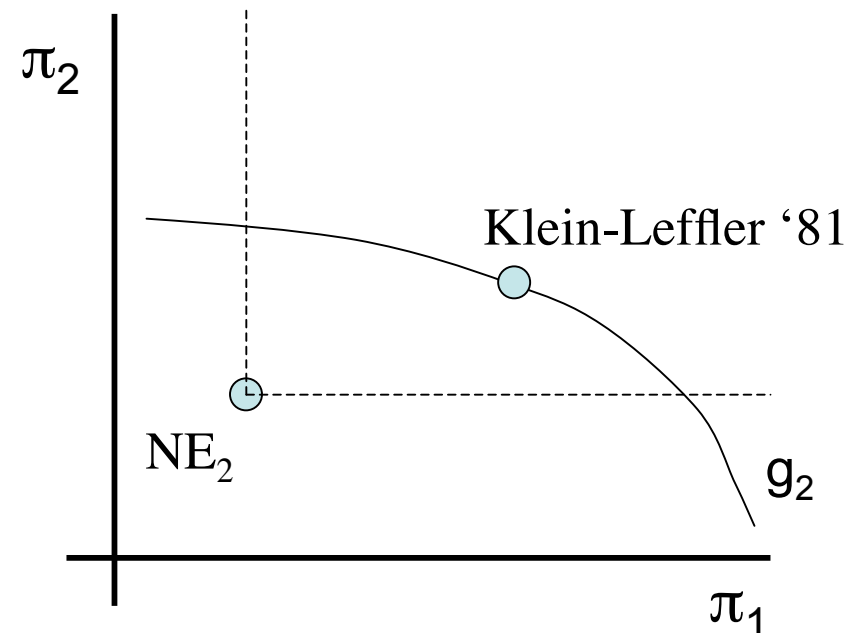
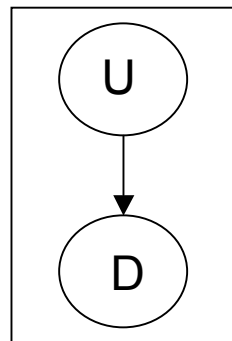


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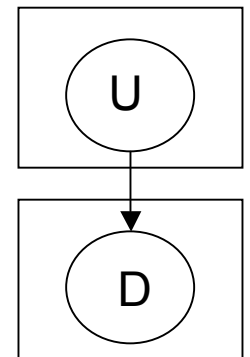
# 3. Formal and Relational Interact (Part 2: Control, not Pricing)



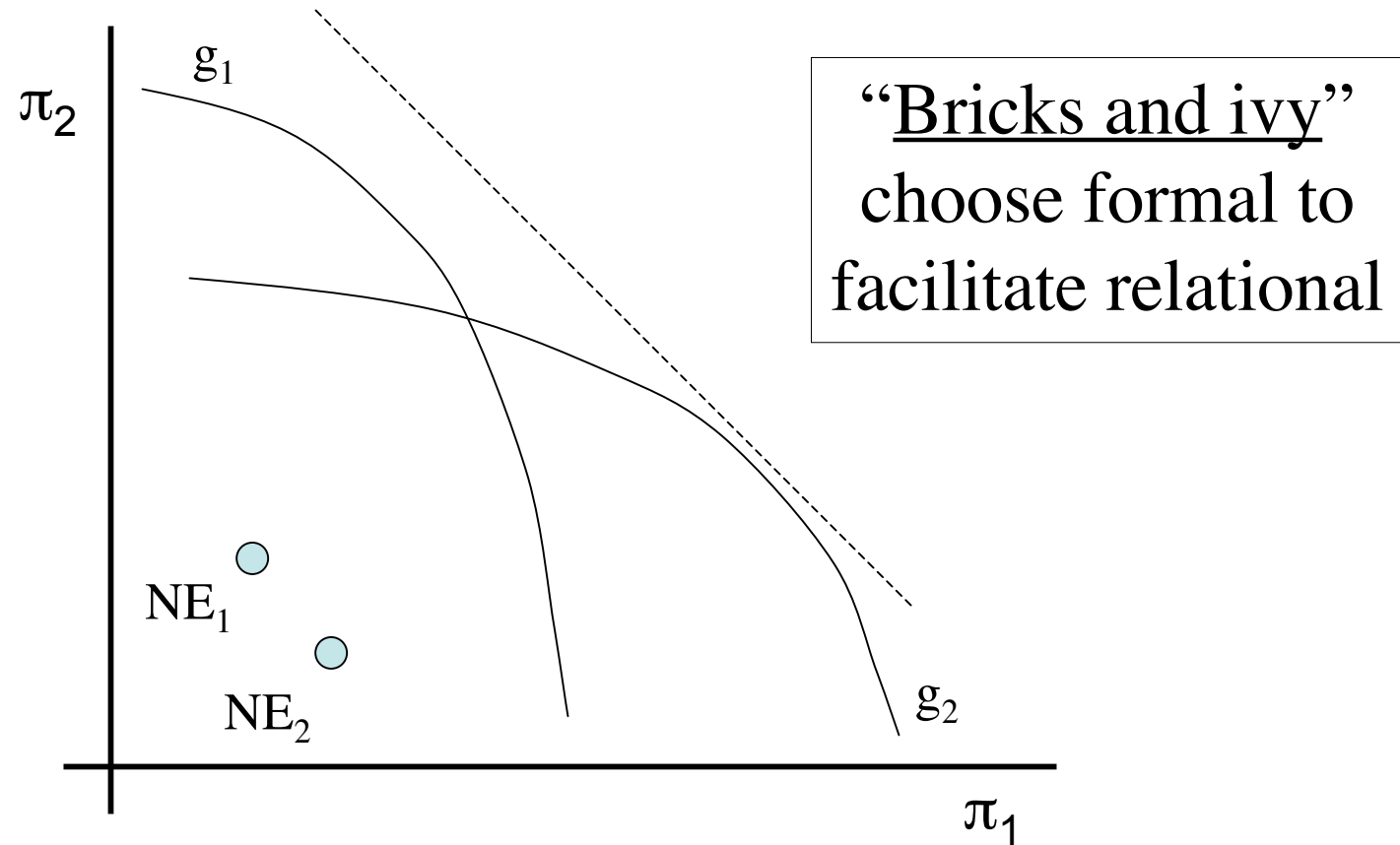
$g_1 =$  Integration



$g_2 =$  Non-integration



# 4. Institutional Design



# Example: Contracting for Control

(Klein *Rd'EI* 00; Lafontaine-Raynaud 02)

1. Many business relationships are self-enforced
2. Parties not indifferent regarding contract terms
3. Contract terms *control* renegeing temptation
4. Contract terms *create* renegeing temptation

# Elemental Model

- 2 parties  $i \in \{1, 2\}$
- state  $s \in S$
- alienable DR  $d \in D$
- private benefit  $\pi_i(d, s)$
- $d_i^*(s)$  solves  $\max_{d \in D} \pi_i(d, s)$
- $d^{\text{FB}}(s)$  solves  $\max_{d \in D} \pi_1(d, s) + \pi_2(d, s)$

# Timing (ignoring transfers)

1. Gov. structure                      allocate control to i or j
2. ---
3. State                                       $s \in S$  realized
4. Ex post decisions                       $d \in D$  *non-contractible*
5. Payoffs                                       $\pi_i(d, s), \pi_j(d, s)$

# Analysis of Elemental Model

- first-best decision rule

$$d^{\text{FB}}(s) \text{ maximizes } \pi_A(d, s) + \pi_B(d, s)$$

$$V^{\text{FB}} \equiv E[\pi_A(d^{\text{FB}}(s), s) + \pi_B(d^{\text{FB}}(s), s)]$$

- spot governance

$$V_i(s) \equiv \pi_A(d_i^*(s), s) + \pi_B(d_i^*(s), s)$$

$$V^{\text{SP}} \equiv \max\{E[V_A(s)], E[V_B(s)]\}$$

# Relational Governance

- payments:  $t_{ig}, \tau_{ig}(s), T_{ig}(d, s)$
- timing:  $t, s, \tau, d, T$
- decision rule:  $d^{RC}(\cdot)$
  
- $R_i(s | d^{RC}(\cdot)) \equiv \pi_i(d_i^*(s), s) - \pi_i(d^{RC}(s), s)$
  
- $V(d^{RC}(\cdot)) \equiv E[\pi_A(d^{RC}(s), s) + \pi_B(d^{RC}(s), s)]$

# Basic Results

Proposition 1 (~ MM 89, L 03)

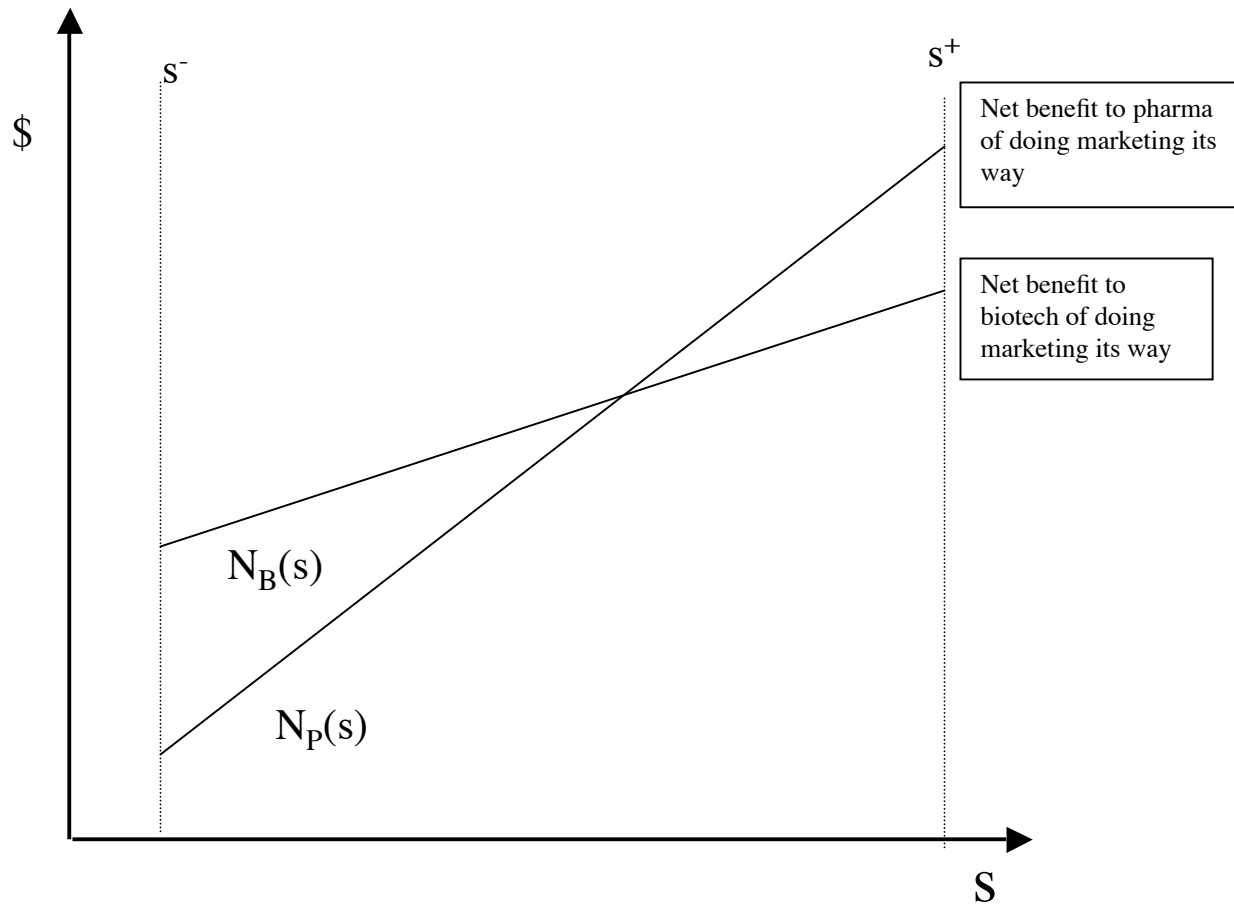
If party  $i$  has the decision right, then the parties can implement the decision rule  $d^{RC}(\cdot)$  if and only if

$$\max_s R_i \left( s | d^{RC}(\cdot) \right) < \frac{1}{r} \left[ V \left( d^{RC}(\cdot) \right) - V^{SP} \right]$$

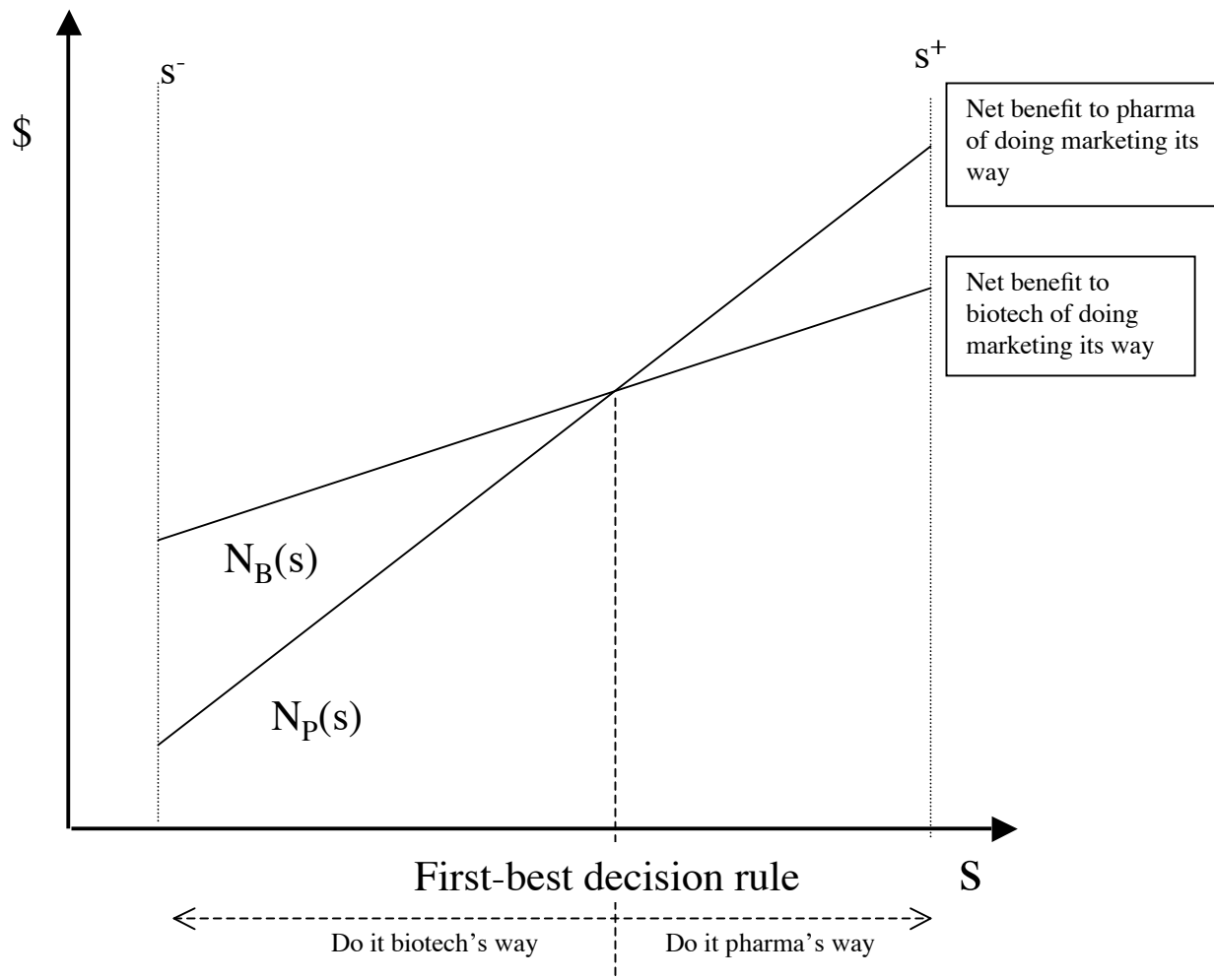
Proposition 2

The optimal governance structure for implementing the decision rule  $d^{RC}(\cdot)$  solves

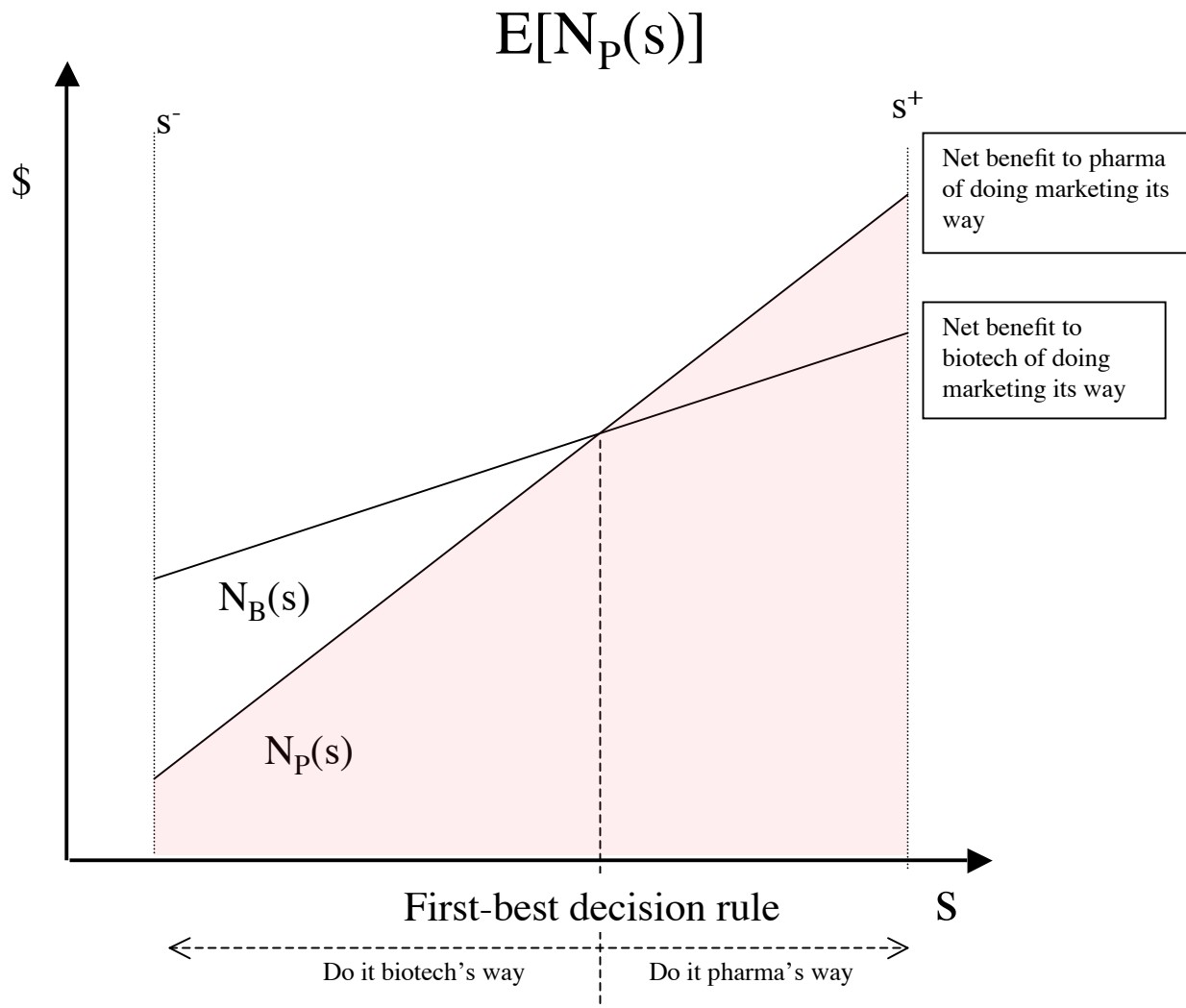
$$\min_i \left[ \max_s \left( R_i \left( s | d^{RC}(\cdot) \right) \right) \right]$$



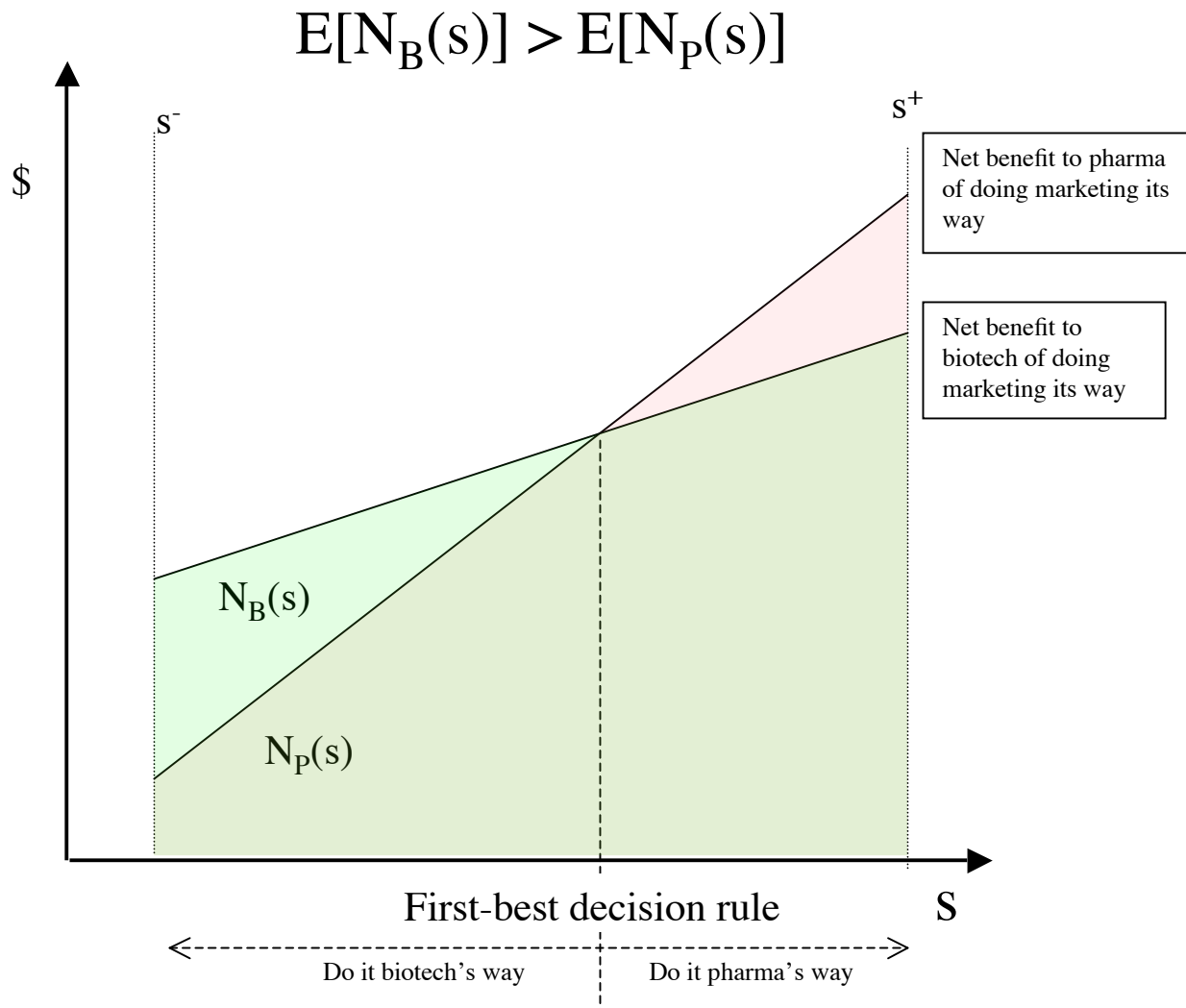
Example 1: “conflicting” intensities



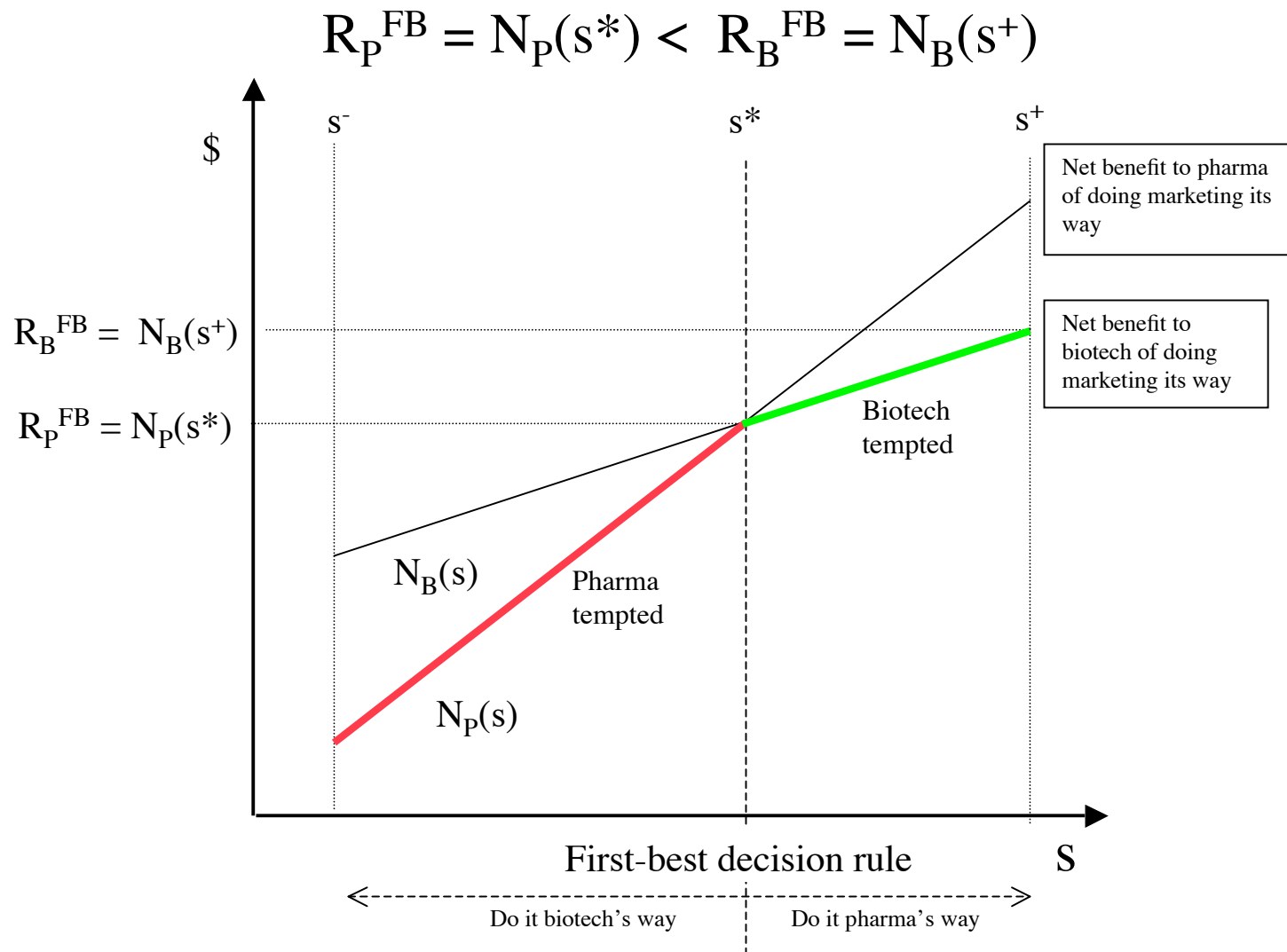
First-best decision rule



Optimal allocation of control in “spot” transactions?



Optimal allocation of control in spot transactions:  
give DR to the biotech



Optimal allocation of control in “relational” transactions:  
give DR to the pharma

## II. Politics: Summary

- XXX

# II. Politics: Critique

- XXX

# I. Pricing

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# III. Path-Dependence

(N. Beaulieu, R. Henderson, N. Repenning, & J. Sterman)

1. There exist persistent performance differences among seemingly similar enterprises.
2. Understanding these performance differences is important for business strategy, government policy, and economic research.
3. Management practices play an important role in creating and sustaining these performance differences.
4. Building and changing relationships is an important example of these management practices.
5. Economic models of path-dependence in building and changing relationships are on the horizon.

# Who Cares (About PPDs)?

## 1. Strategy

- Explain?
- Manage?
- Fix?

Lucas *JME* 1988: 5

“I do not see how one can look at figures like these without seeing them as representing *possibilities*.”

“This is what we need a theory ... *for*: to provide some kind of framework for organizing facts like these, for judging which represent opportunities and which necessities.”

## 2. Policy

- Cyert & March ‘63
- Antitrust, Trade, Research, Climate, ...

## 3. Economics

- Industry dynamics
- International trade

Ericson-Pakes *RES* 1995: 53

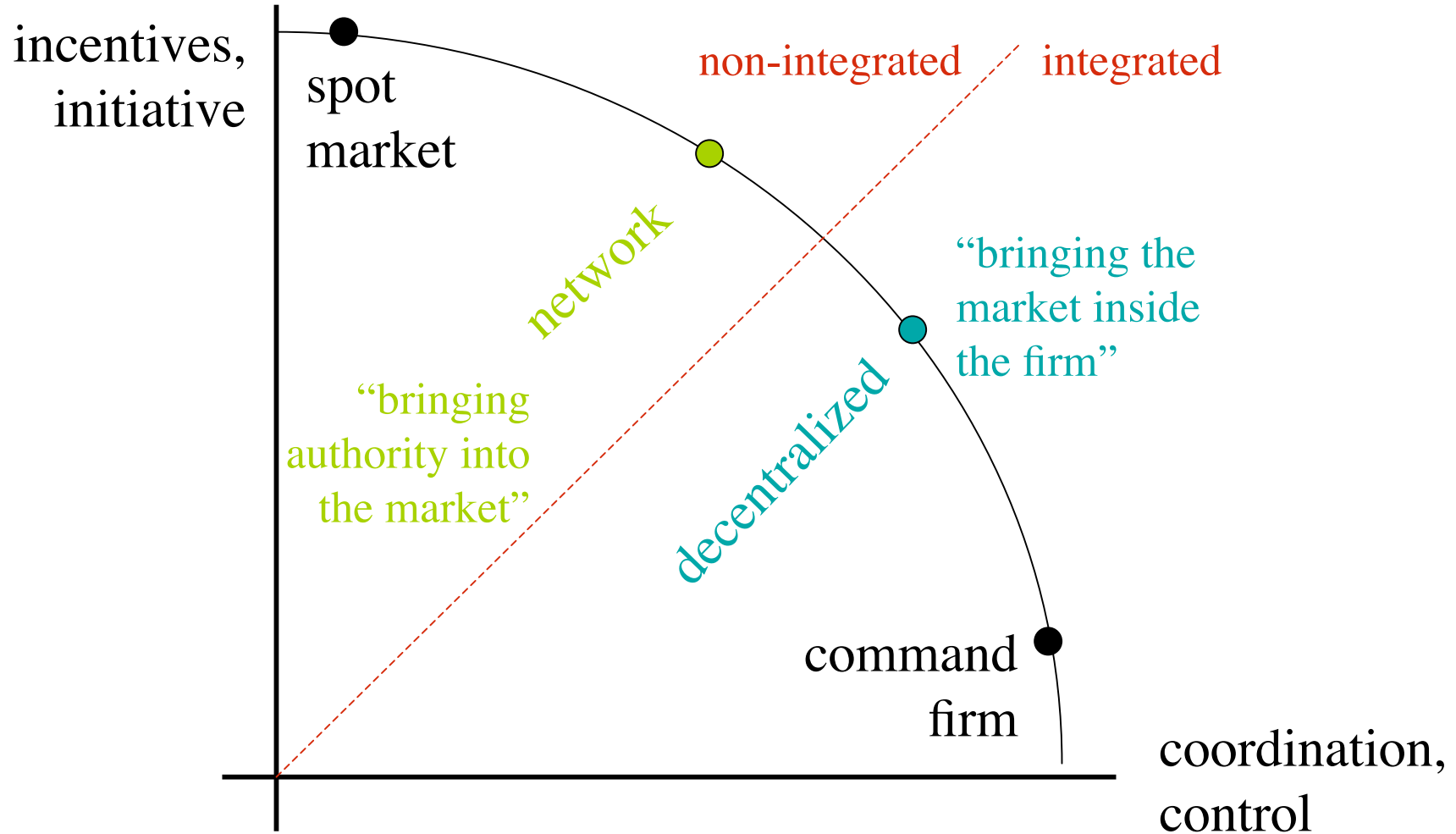
“We provide a model of industry behavior which, because it incorporates ... *firm-specific sources of uncertainty*, can generate the variability in the fortunes of firms observed in these data.”

Melitz *Ecta*. 2003: 1695

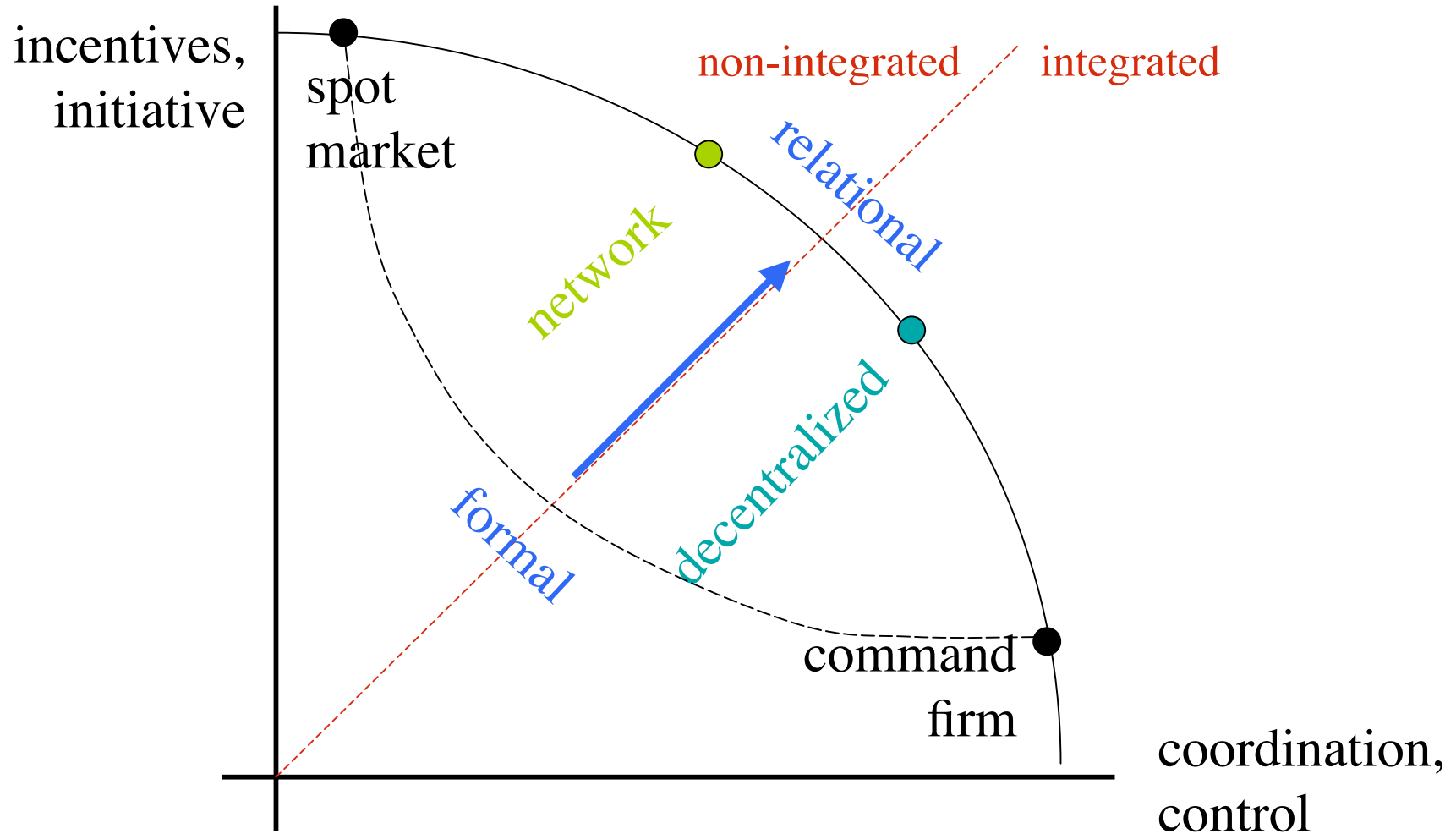
“This paper develops a dynamic industry model with *heterogeneous firms* to analyze the role of international trade as a catalyst for these inter-firm reallocations within an industry.”

# The Goal

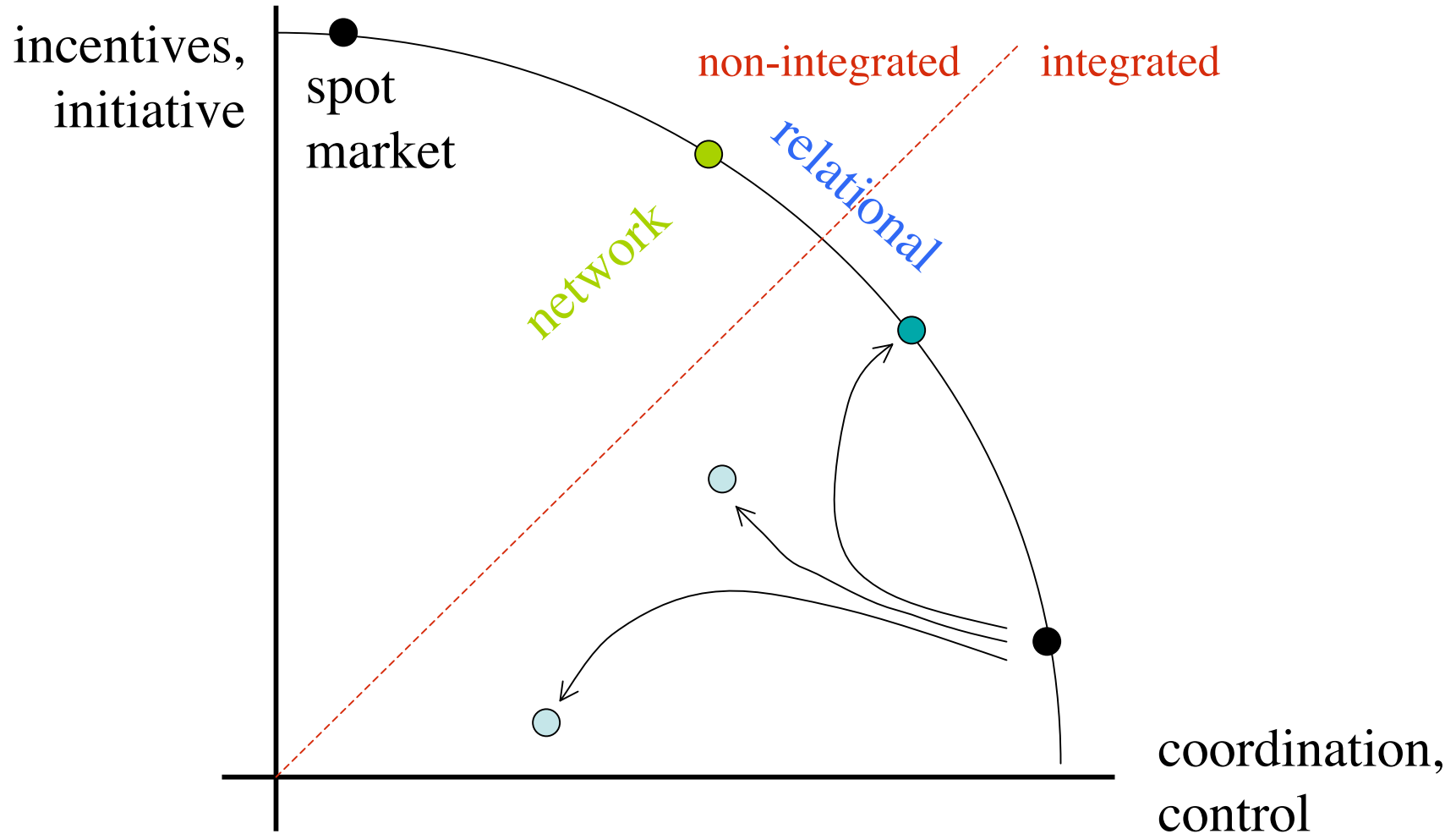
“markets motivate, hierarchies control ...”



# The Method (?)



# The Problem (??)



# Existing Theory

- What the Folk Theorem Tells Us (about PPDs)
  - Range of equilibria under fixed governance structure [Leibenstein 67]
  - Different ranges under different governance structures
- What It Does Not
  - Building an understanding
  - Changing an understanding

# Towards New Theories

- [[ • Ellison-Holden 07  
“A Theory of Rule Development” ]]
- [ • Chassang 07  
“Building Routines” ] ?

“Routines are necessarily home-grown.”

# Learning to Coordinate

- Cremer, Garicano & Prat (*QJE* 06)
  - *Choosing a code*
  - $\pi_i(d_1, d_2, s) = 1$  iff  $d_1 = d_2 = d^*(s)$
  - $m \in M, c(m), f(s) \Rightarrow m^*(s)$
- Weber & Camerer (*Mgt. Sci.* 03)
  - *Growing a code*
  - Office pictures + telephone
  - Uday Rao



# Learning to Coordinate (cont.)

- Selten & Warglien (PNAS 07)

- *Measuring a code*

- $S = S_1 \times S_2$

- $M = \{J, 7, @, \$, \rightarrow, \clubsuit, \partial\}$

- $c(m)$

- Converge to coordination? (3/4)

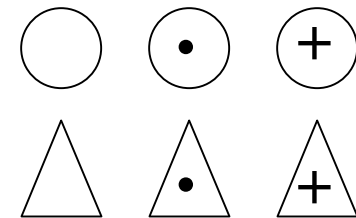
- Codes? (1/4, 1/4, 1/4)

- Non-grammatical list:  $m^*(s) \in M$

- Compositional grammar:  $J7 = 7J$

- Positional grammar:  $J7 \neq 7J$

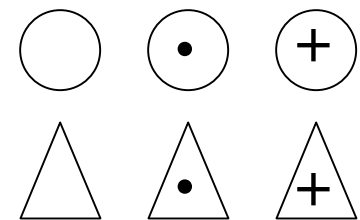
experiment



# Learning to Coordinate (cont.)

- Ellison & Holden 07
  - *Building a code*
  - $s \in S$
  - $L = \{a, b, c, d, e, f, \dots\}$
  - $m \in 2^L$
  - $c(m) = \#m$
  - $m' = g(m)$
  - Cheap to use vs. easy to learn
    - Mastermind
    - Newcomers
    - New states

example



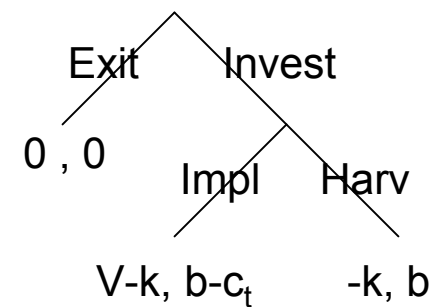
# Building Routines: Learning and the Dynamics of Efficient Cooperation under Asymmetric Information

S. Chassang '07

- “Routine” = current behavior depends on only current state (*i.e.*, no path-dependence)
- Best equilibrium reaches routine in finite time
- Routine may not be efficient
- Different paths to same routine
- Different paths to different routines (path-dependence)

# Chassang 07

- Exit game ( $\sim$  repeated trust game)
  - Agent “invests” or exits
  - $s_t$  publicly observed
  - $c_t = c(s_t)$  privately observed
  - Principal “harvests” or “implements”
  - $c_L < V < c_H$



- Ambiguity
  - Can’t describe; must experience
  - Literal: learning cost drivers
  - Figurative: refining an “almost”

$s_1$	$s_2$
$s_3$	$s_4$

{L, L, H, H}

# Chassang 07 (cont.)

- Revelation only if IC constraint holds
  - Exit probability  $\{s_2\}, \{s_4\}, \{s_1, s_3\}$
  - Value of revelation to date  $\{\{L\}, \{H\}, \{L, H\}\}$
  - Optimal stopping
- “Building a Routine”
  - “Routine” = choose to stop learning (so no more exit)
  - Best equilibrium reaches routine in finite time
  - Routine may not be efficient (*i.e.*, coarse partition)
  - Different paths to same routine (*e.g.*,  $c_L$  first vs.  $c_H$ ?)
  - Different paths to different routines (*i.e.*, different partitions) *with different efficiencies*