Overview of Organizational Economics

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2008

Microstructure

- Job Design
- Career Design

Macrostructure

- Internal Structure
- Boundaries of Firms

Job Design: What activities should individuals engage in? Who should decide? On what should their compensation be based? More specifically,

- How should tasks be allocated among individuals at the same hierarchical level?
- Should individuals be rewarded independently of one another? on the basis of relative performance and hence encouraged to compete? on the basis of group performance and hence encouraged to cooperate?
- How much discretion should individuals be given in deciding how to allocate their time, i.e. should jobs be flexibly or rigidly defined?
- How much use should be made of objective (i.e. contractible) performance measures and how much of subjective (i.e. noncontractible) measures?

Static models of multi-task incentive pbms have generated numerous insights into these questions (Holmstrom and Milgrom, JLEO, 91; Itoh, JLEO, 92)

- These models highlight the effects of job design variables on the tradeoff between insurance and incentives for risk-averse individuals.

Job Design: Flexible vs. Rigid Jobs

Holmstrom and Milgrom, 91: risk-averse employee privately chooses how much attention to devote to a company task and to personal business activities.

- Personal business activities may be socially valuable, but returns accrue to employee. These activities cannot be monitored, but prohibition is feasible.

Result 1: As measuring performance on company task becomes easier, pay should become more sensitive to performance, and more personal business activities should be permitted. If measuring performance is sufficiently difficult, some personal business activities which are socially valuable should be prohibited.

Result 1 may help explain trends over time towards i) more flexible job definitions for middle managers and ii) more performance-related pay. Argument: These changes have occurred along with two significant improvements in perf. measurement:

- development of measures of non-financial aspects of performance such as quality, customer satisfaction, and market share

- greater ability to use these measures, and financial ones, through improved IT

But several key predictions of static multi-task models have failed to find the expected empirical support (Prendergast, JEL, 99):

- Weak evidence of a negative relationship btw. "risk" and strength of incentives (Prendergast, JPE, 02).

- Firms often use risky "output" performance measures even when riskless "input" measures are available (Murphy, 99).

- Changes in performance caused by known events outside agents' control may not be filtered out (Bertrand and Mullainathan, QJE, 01).

- Little empirical evidence of use of relative performance evaluation (RPE) (Prendergast, 99).

Three main approaches adopted to resolving these puzzles:

1. Static models with **technological uncertainty** where agent is better informed than principal about how output depends on agent's inputs, and hence about "what agent *should* be doing" (Raith, 08; Prendergast, JPE, 02).

- Even if agent's inputs can be monitored perfectly, while ouptut is noisy, such technological uncertainty can make it optimal to base a risk-averse agent's compensation at least partially on output.

- Greater technological uncertainty $\longrightarrow$ stronger output-based incentives.

2. **Dynamic** analyses

- Decisions about job design influence not only incentives but also how organizations *learn* about employees' abilities (Meyer, QJE, 94; Meyer, REStud, 91; Prendergast, JOLE, 02)

- Incentives are provided not only by *explicit* performance-related pay but also by *implicit* mechanisms, which are intrinsically dynamic.
  - When performance is informative about ability and firms cannot contractually commit themselves to future behavior, then implicit incentives arise in the form of career concerns and/or the ratchet effect.
  - The effects of job design decisions (e.g. the use of RPE) on implicit incentives are different in nature from their static incentive effects and can be the dominant ones (Meyer and Vickers, JPE, 97; Meyer, Olsen, and Torsvik, JEBO, 96).

3. For understanding *executive* compensation, principal-agent paradigm may be inadequate and may need to be supplemented/replaced with a "managerial power" perspective (Bebchuk + Fried, 04).

Career Design: What procedures should determine how individuals move from job to job within the organization and when they leave? How should the time-path of compensation be designed? More specifically,

- When should positions be filled from within the orgn and when by external recruitment?
- When should orgns. use lifetime employment? "up-or-out" contracts? mandatory retirement?
- How should employees be induced to acquire firm-specific skills?
- When is mentoring of junior employees by senior employees important? How can it be induced? What are its consequences?
- What use should be made of performance appraisals? When should they be given? By whom? What consequences should they have?
- When should 'fast tracks' be used? When should 'uniform early treatment' of employees be maintained?

- Dynamic analyses of employees' effort incentives and compensation schemes when firms can commit to long-term contracts—emphasize role of "memory" in relaxing incentives/insurance tradeoff.

- Competition for employees from the outside labor market may provide incentives but may constrain i)wage paths and hence insurance and ii)job assts.

- Limitations on firms' ability to commit to long-term contracts may hamper provision of incentives (the 'ratchet effect').

- Career design may be influenced by the need to curb *managers'* incentives to
  - "exploit" talented indivs. by not paying them enough $\longrightarrow$ "up-or-out" rules
  - succumb to employees' attempts at influence (e.g. through bribes) $\longrightarrow$ promotions instead of bonuses
  - "free ride" on mentoring efforts of their colleagues $\longrightarrow$ partnerships

- Career design may be influenced by the need to learn about employees' abilities.

Career Design: Fast Tracks vs. Uniform Treatment

Fast tracks: designate individuals as "stars" at early stage and provide extra opportunities (e.g. training or job assignments) that enhance the likelihood that they will advance faster than their peers

- This is a notion of "active" intervention. Contrast use of "fast track" by Chiappori et al, JPE, 99—positive correlation of wages at different points in time.

Uniform early treatment: promotion of employees solely according to seniority in early stage of their careers (e.g. at large Japanese firms)

Advantage of Fast Tracks: Biasing contests can improve information about abilities (Meyer, REStud, 91):

Ex ante identical employees i, j, whose abilities are unknown to all. After 2 periods, firm tries to promote the more able employee:

$$\Delta x^t = \Delta\eta + \epsilon^t, \quad t = 1,2, \quad \text{where} \quad \Delta x^t \equiv x_i^t - x_j^t, \quad \Delta\eta \equiv \eta_i - \eta_j$$

Firm gets only rank-order information, but can costlessly choose "bias" c^t each period, so learns whether $\Delta x^t < -c^t$ or $\Delta x^t \geq -c^t$.

Bias is implementable by unequal treatment.

Assume: $\Delta\eta$ symmetric about 0; ϵ^1, ϵ^2 independent and symmetric about 0; larger Δx^t signals larger $\Delta\eta$ (MLRC).

Result 2a: Optimal 2nd-period bias favors 1st-period winner.

Result 2b: It may be optimal to bias the 1st contest, i.e. to design careers asymmetrically from the start.

Further Advantages of Fast Track Policies

Promotions may leak information about employees' abilities to rival employers; favoring early stars in later promotions may minimize the wage costs of leaks (Bernhardt, REStud, 95, building on Waldman, Rand, 84).

Ability, training, and job level may be complementary inputs; promotion of the more able even before they are qualified can credibly signal high ability, hence induce training, hence improve future prospects (Prendergast, JJIE, 92).

Pros vs. Cons of Fast Tracks

A disadvantage of fast tracks is that they may demoralize slow starters.

But because prospect of joining a fast track enhances early incentives, overall incentive effect can be positive (Meyer, *Annales...*, 92)

Effects of fast tracks on incentives and on quality of job assignments most likely to conflict when early performance is informative about ability.

Choice between fast tracks and uniform early treatment may depend on

- who makes this choice (senior managers may weight learning more heavily than incentives)
- extent of delegation of decision-making authority (less delegation implies learning relatively more important)
- pressure from external labor market (affects feasibility of uniform early treatment)

Internal Structure: Centralization vs. Delegation

Evolution of the large corporation (Chandler, 62; Williamson, 75)—from U-form ("unitary"), in which employees grouped according to function, to M-form ("multi-divisional"), in which employees grouped according to products or processes

- switch to M-form accompanied by delegation of decision-making to division mgrs; top mgt's role: reallocation of cash flows via "internal capital market"

More recent trends: Expansion in number of independent profit/cost centers; more use of cross-functional or cross-departmental teams, coordinated laterally rather than vertically

- Cross-sectional evidence in Acemoglu et al, 06: decentralization more likely for firms that are closer to the technological frontier, in more heterogeneous environments, and younger.

Why should delegation of decision-making be valuable? If

- no limitations on communication;
- no limitations on processing of information;
- top management can commit to how will respond to all possible reports by employees, then

Revelation Principle (Myerson, 82): Any non-cooperative equilibrium outcome of an arbitrary organizational structure can be replicated by a centralized two-tier structure, in which each employee is given incentives to communicate truthfully all of his private information directly to top management.

So for delegation of decision-making to be valuable, it must be that one or more of the following conditions apply:

- communication is costly (Melumad et al, JAE, 92, Rand, 95; Rotemberg, JEMS, 99)

- processing of information is costly, so without delegation, top management faces 'information overload' (Geanakoplos + Milgrom, JJIE, 91; McAfee + McMillan, JEMS, 95)

- management's ability to write complete contracts is in some way limited (Aghion + Tirole, JPE, 97)

A second fundamental issue: *To what extent is formal delegation of decision-making authority* **possible** *within a firm?*

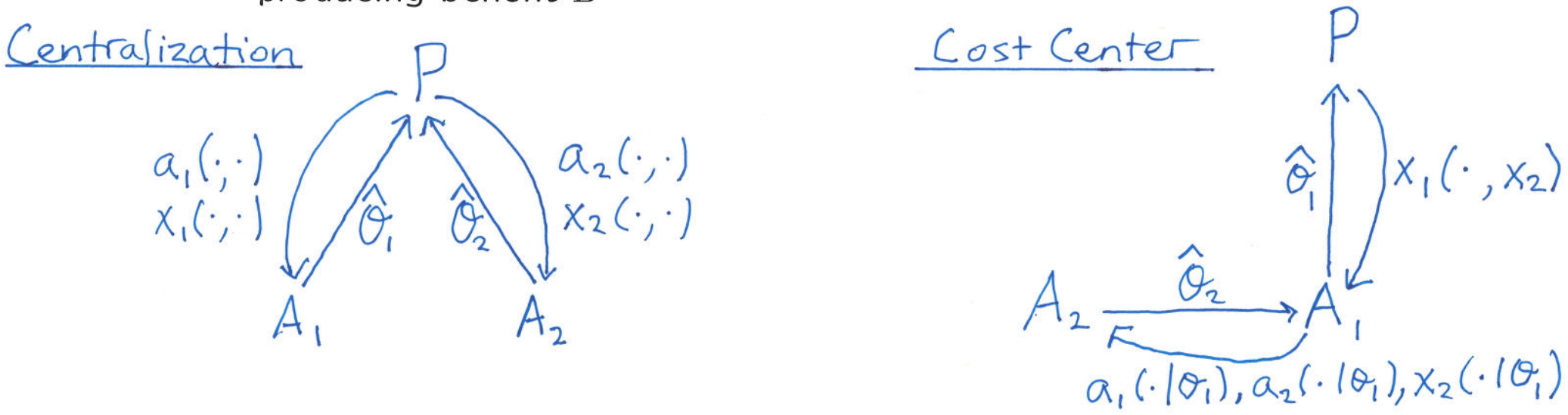
- Milgrom and Roberts (90, 92) and Meyer, Milgrom, and Roberts (JEMS, 92) argue that top management always has discretionary authority to intervene in the activities of subunits or subordinates.

- Similarly, Baker, Gibbons, and Murphy (JLEO, 99) argue: "decision rights in organizations are not contractible; the boss can always overturn a subordinate's decision, so formal authority resides only at the top."
  - BGM examine when decision rights can be *informally* delegated through self-enforcing relational contracts.
  - Decentralized decision-making may be efficient but not achievable, because either boss or subordinate may have incentive to renege on the informal agreement.

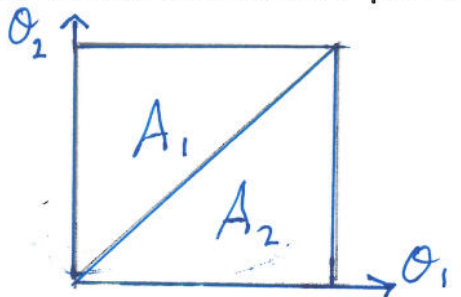
- In contrast to BGM's approach, Aghion and Tirole (JPE, 97) and Dessein (REStud, 02), among many others, assume that decision rights can be formally delegated. Focus is then on conditions under which formal delegation is advantageous:
  - Aghion and Tirole: delegation advantageous when it is crucial to provide subordinates with incentives to generate ideas and/or acquire information;
  - Dessein: delegation advantageous when subordinate has private information about the efficient decision and principal cannot commit to a mechanism to elicit the information.

Centralization vs. Delegation to a Responsibility Center: The Effect of Communication Costs (Melumad, Mookherjee, and Reichelstein, 92, 95):

- P, A_1, A_2 risk-neutral
- A_i produces output a_i at cost $a_i\theta_i$; receives payment x_i
- θ_i privately observed by A_i before contracting; $a_i\theta_i$ also private
- θ_1, θ_2 independent, continuously distributed
- P has benefit function $B(a_1, a_2)$; chooses structure to minimize total cost of producing benefit $\bar{B}$



Result 3a: With unlimited communication, cost center and centralization perform equally well.



Example: $B(a_1, a_2) = a_1 + a_2$; θ_1, θ_2 i.i.d.

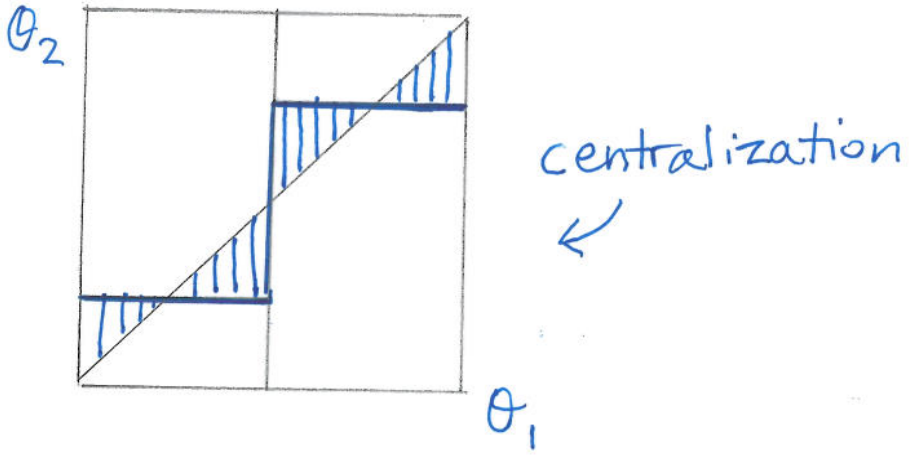
Centralization: P orders A_i with lower θ_i to produce $\bar{B}$.

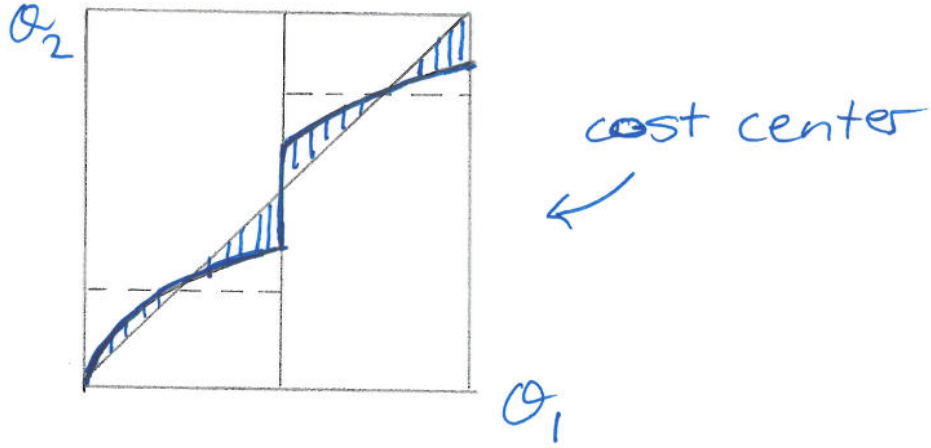
Cost Center: P subsidizes A_1's purchases from $A_2 \Longrightarrow A_i$ with lower θ_i prod. $\bar{B}$.

Limited communication: agents can transmit only coarse summary of private information—in ex., only two possible reports

- delegation now brings a "flexibility gain"

Result 3b: With limited commun., cost center strictly dominates centralization.





Implication of Melumad et al's analyses: Delegation to a cost center can be more efficient than centralized decision-making, when the cost center's financial performance can be monitored *and* when the private information of the manager of the cost center is substantial and difficult to fully transmit to top management.

This result may help explain the trends towards greater delegation and the cross-sectional evidence cited earlier:

- With cross-functional or cross-departmental collaboration, the relevant private information may become harder for an individual senior manager to fully understand $\longrightarrow$ horizontal channels of communication partially replace vertical ones.

- For firms that are closer to the technological frontier, in more heterogeneous environments, and younger, private information of managers likely to be more substantial and complex $\longrightarrow$ decentralization accompanied by close financial monitoring relatively more attractive.

Boundaries of the Firm

What determines whether the assets used to perform a given set of activities are part of one firm or another or constitute an independent enterprise? How do firm boundaries affect the allocation of resources?

Why isn't integration, followed by "selective intervention", always optimal? (Williamson, 85)

With "complete" contracts, boundaries of firms would be irrelevant.

Fundamental idea: ownership of assets matters because contracts are in practice incomplete.

- Ownership of assets affects the *ex post* outcomes under incomplete contracts and/or the *ex ante* actions taken in anticipation of the contractual incompleteness.

What changes when ownership of assets changes?

1. Integration leads to less inefficiency from *ex post* 'hold up' but more 'bureaucratic' inefficiency — "Transaction Cost Economics" (Williamson, 75, 85; Klein, Crawford, and Alchian, JLE, 78)

2. Residual rights of control over physical assets1— "Property Rights Theory of the Firm" (Grossman and Hart, JPE, 86; Hart and Moore, JPE, 90)

3. Rights to return streams of assets (Holmstrom and Milgrom, JLEO, 91, and AER, 94)

4. Information structure (Arrow, Bell J., 75; Riordan, 90; Cremer, QJE, 95)

5. Scope of discretionary authority (Meyer, Milgrom, and Roberts, JEMS, 92; Baker, Gibbons, and Murphy, JLEO, 99)

What type of ownership configurations or changes are being explained?

1. Vertical integration vs. outsourcing: i) ownership on its own (Grossman-Hart-Moore); ii)ownership and formal contracts (Holmstrom-Milgrom; Holmstrom, JLEO, 99; Riordan, 90; Cremer, 95); ownership and relational contracts (Baker et al, QJE, 02, JLEO, 99)

2. Horizontal integration vs. divestiture— advantages and disadvantages of internal capital markets (Meyer et al; Stein, J. of Fin., 97; Scharfstein + Stein, J. of Fin., 00; Inderst + Laux, Rand, 05)

3. Non-traditional organizational forms: joint ventures, strategic alliances, networks, business groups, etc. (Baker et al, JJIE, 08; Robinson, RFS, 08)

What type of variation in ownership of business units is being explained?

- Cross-sectional variation

- Time-series variation

Using Influence Cost Theory to Understand Pros and Cons of Internal Capital Markets and to Explain Horizontal Divestitures

Boundaries of firms determine range of management's discretionary authority. Increases in this range have both benefits and costs:

Benefits: enlargement in the set of possible interventions, e.g. greater scope for reallocating labor and capital across divisions

- cf. "winner-picking" role of corporate HQ in Stein, JFin, 97

Costs arise because (i) interventions have redistributive consequences and (ii) employees most affected often possess highly relevant information

- Result: Increase in employees' incentives to engage in "influence activities" (Milgrom and Roberts, 00)—attempts to alter management's discretionary decisions
  - cf. "rent-seeking activities"

Influence activities impose "influence costs" on the firm. These include

- opportunity costs of resources expended on influence—this is the focus of Meyer, Milgrom, and Roberts, JEMS, 92
- efficiency costs of distortions in decisions—this is the focus of Scharfstein and Stein, JFin, 00
- degradation in performance when orgl. policies or structure are altered to limit influence

When are influence costs in internal capital markets most severe? What types of divisions are most likely to be divested (i.e. turned into stand-alone firms or sold to a buyer)?

Empirical work has suggested:

1. Declining units and units not closely related to the parent firm's core activities are most likely to be divested.

2. Divestitures that increase the parent firm's "focus" are associated with positive stock price reactions.

3. Buyers of divested units tend to be already in the divested unit's line(s) of business.

Meyer, Milgrom, and Roberts model: signal-jamming model to study how eqm level of influence costs in a division varies with its prospects and with its closeness to the parent firm's core activities

Model of performance under integration:

- dynamic game between top management ("firm") and management team of unit ("managers")
- each period, firm adjusts employment, based on informative report by managers about productivity shock
- managers manipulate report (at cost to themselves and firm) to protect quasi-rents, which they would lose if laid off
- how does eqm level of influence costs vary with unit's prospects and with degree of "focus" of parent firm?

Model of performance as stand-alone firm:

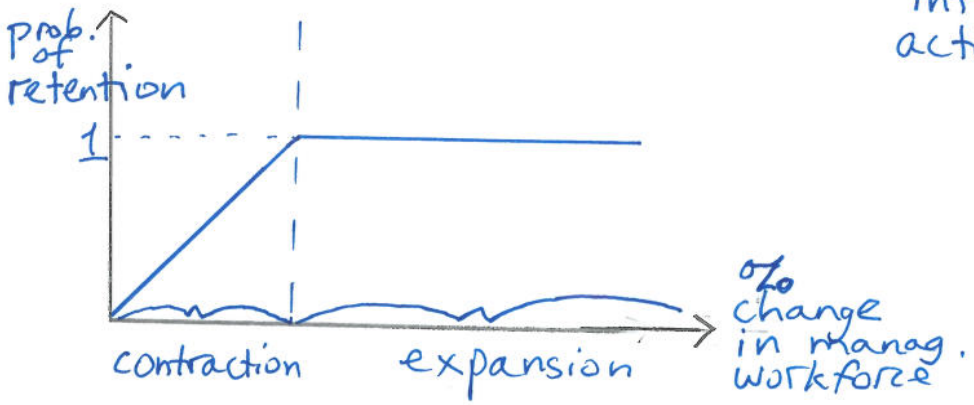
- employment not based on report by mgrs, but incentives for influence are eliminated

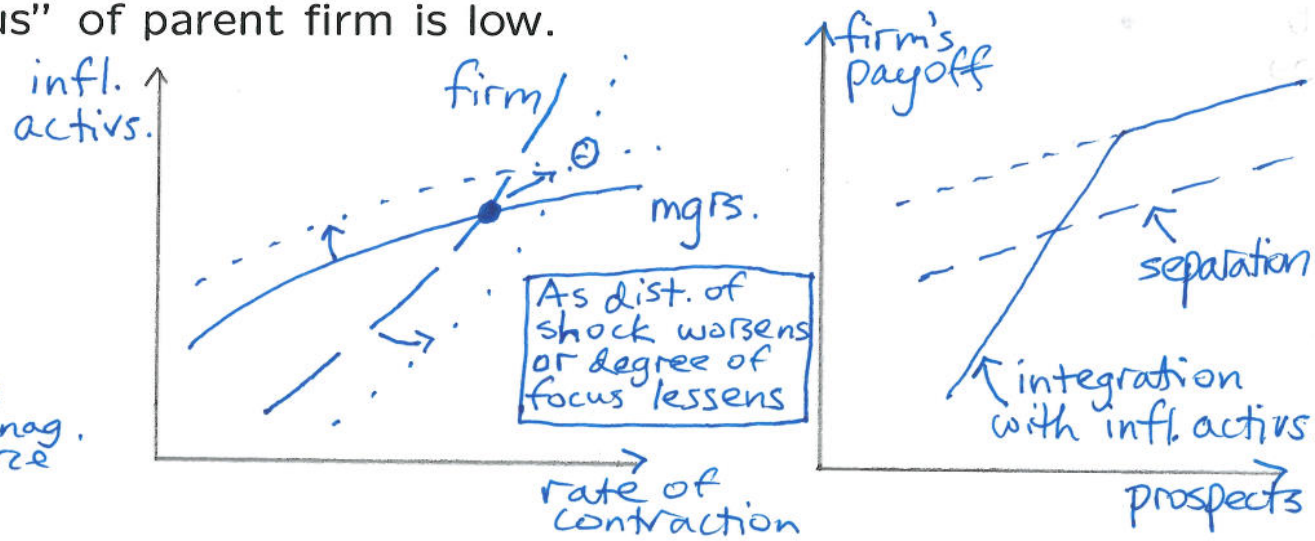
Expansions and contractions in managerial workforce have *asymmetric* effects on managers' payoffs: contractions impose risk of losing quasirents, while expansions leave quasirents unchanged.

Result 4a (Prospects): When the distrib. of the unit's productivity shock worsens in the sense of first-order stoch. dominance, equilibrium levels of influence activity and influence costs increase.

Result 4b (Focus): An increase in the probability that a manager laid off from unit can be reassigned elsewhere within the parent firm decreases eqm levels of influence activity and influence costs.

Result 4c (Separation): Separation of unit from parent firm is never optimal in the absence of a risk of layoffs, but may become optimal as prospects worsen, particularly when degree of "focus" of parent firm is low.





Microstructure: Job Design and Career Design

Macrostructure: Internal Structure and Boundaries of Firms

These various aspects of organizational design cannot be fully understood in isolation from one another:

- e.g. desirability of fast tracks depends on degree of delegation of decision-making

- e.g. nature of interactions among a firm's units will affect benefits and costs of divesting a given unit

Choices about organizational structure are closely linked to choices about technology, corporate governance, and strategy:

- e.g. shift in technology away from classic mass production towards "flexible production" has implications for flexibility of jobs and extent of delegation

These interlinkages increasingly explored in both theoretical and empirical work:

- Theoretical work has identified sets of activities or practices which are *complementary*, in the sense that a high level on one dimension should be accompanied by high levels on the others.
  - Holmstrom and Milgrom (AER, 94) identified complementarities among instruments for controlling incentives.
  - Milgrom and Roberts (AER, 90) examined complementarities among a broader set of variables, incl. technological variables.
- Empirical work on the productivity effects of innovative employment practices, such as incentive pay, problem-solving teams, training, and flexible job assts.:
  - Such practices are more effective when implemented together rather than singly, and bring greater net benefits in firms that make complex products and/or are starting up new facilities (Ichniowski and Shaw, JEP, 03).
  - Such practices bring greater benefits when adopted along with new computer technologies (Bresnahan, Brynjolfsson, and Hitt, QJE, 02).