

A Theory of Front-line Management

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Motivation

- ▶ Large (hierarchical) organization
- ▶ Managerial positions differ in expertise, information, authority
- ▶ Bottom of the hierarchy: front-line *manager*
 - ▶ adapt worker's tasks to changing needs (incomplete contracts)
 - ▶ limited access to compensation: unable to adjust the worker's *wage* to work fluctuations... but can offer other incentives
- ▶ An important role of the front-line manager — complement the worker's contract in a changing environment

The residual contracting problem

- ▶ Incentives/Perks: work from home, convenient shifts, exemption from certain duties, general flexibility at work..
 - ▶ *perishable*
 - ▶ *small* (per period)
- ▶ Compensate the worker for *large* (extra) effort on random occasions

Asynchronicity of effort and compensation

Characterize optimal contracts for any pair of discount rates

- ▶ Various "managerial styles": recency bias, seniority, responsiveness of compensation to effort...
 - ▶ Relative patience
 - ▶ Information

Bigger picture: Evaluate and compare from the organizational perspective and draw connections to value, retention, promotion patterns, etc..

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Model

- ▶ Manager has commitment power; worker does not
- ▶ Infinite horizon continuous time; discount rates r_w, r_m
- ▶ Manager can provide *flow* compensation $\varphi \in [0, 1]$.
- ▶ Opportunities arrive at a Poisson rate μ .
 - ▶ If an opportunity is available, worker chooses $\alpha \in [0, 1]$.
Payoffs:
 - ▶ worker: $-\alpha A$
 - ▶ manager $+\alpha B$ (... $B > A$)
- ▶ Information:
 - ▶ Effort is observable
 - ▶ Analyze the cases of observable and concealable opportunities

Assumption: $A + \frac{\mu A}{r_w} < \frac{1}{r_w}$ (no fundamental shortage of incentives)

Contracts

- ▶ A contract specifies:
 1. “work schedule” $\alpha : H \rightarrow [0, 1]$
 2. “compensation plan” $\varphi : H \rightarrow [0, 1]$

Characterize the optimal contract for any pair of discount rates and study the dynamics of effort and incentives.

<i>Opportunities</i>	<i>Manager</i>		
	Patient	Slightly Impatient	Very Impatient
Observable	Conditional promises (Finite)	Tenure-based seniority system	
Concealable	Accumulating promises (Finite)	Accumulating promises (Infinite)	Performance-based seniority system

Table: Incentive Dynamics.

Observable Opportunities, Patient Manager

- ▶ No compensation before work
- ▶ Increasing work-compensation lag is costly: Pay as quickly as possible
- ▶ Cheapest way to pay for a given opportunity:
 - ▶ $\varphi = 1$ for a given time interval, immediately after effort
- ▶ Dynamic spillover between opportunities: compensation takes time; new opportunities may arrive; compensation on some opportunities is delayed

Solution: $\varphi = 1$ for longer period, if no opportunities arrive

- ▶ Avoid future delays in compensation
- ▶ Compensation resources are used more efficiently - available when needed
- ▶ Conditional promises / Have you done anything for me lately?

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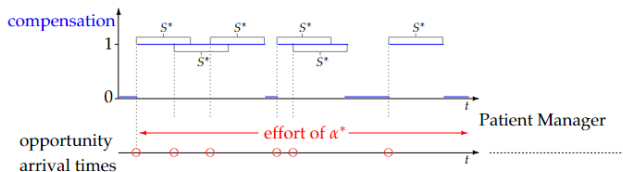
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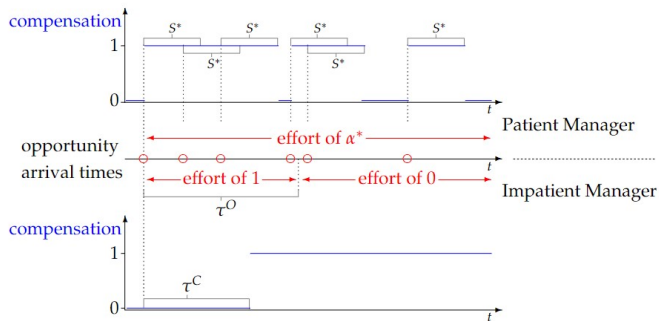


Observable Opportunities, Impatient Manager

- ▶ *Tenure-based seniority system:*
 - ▶ **Junior:**
 - ▶ max effort, $\alpha = 1$
 - ▶ no compensation, $\varphi = 0$.
 - ▶ **Intermediate:**
 - ▶ max effort, $\alpha = 1$
 - ▶ max compensation, $\varphi = 1$.
 - ▶ **Senior:**
 - ▶ no effort, $\alpha = 0$
 - ▶ max compensation, $\varphi = 1$.

Promotion times depend only on the arrival time of 1st opportunity.

Observable Opportunities



Observable Opportunities:

- ▶ Low correlation between effort and compensation
- ▶ Arrival of an opportunity - typically “bad news” for the worker

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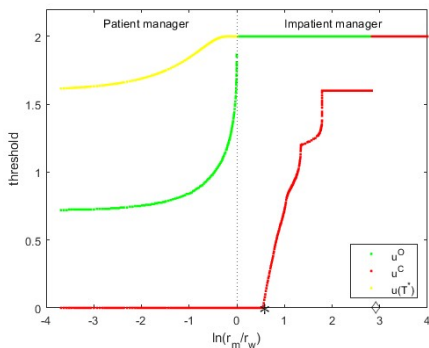
Table: Incentive Dynamics.

Concealable opportunities:

- ▶ Perfect bookkeeping: “effort = compensation”

Concealable Opportunities

- ▶ Optimal Markovian contracts:
 - ▶ State: u = worker's continuation utility
 - ▶ Work threshold: Incentivize effort whenever $u < u^O$
 - ▶ Compensation threshold: max compensation whenever $u > u^C$



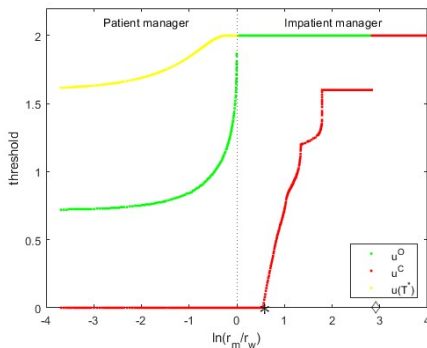
Concealable opportunities, Patient manager

Incentives: unconditional immediate time interval with $\varphi = 1$

- ▶ prolonged when new opportunities are incentivized

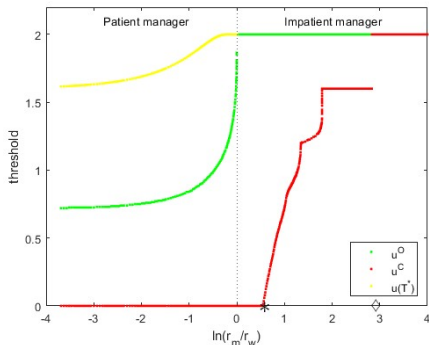
Incentivize effort so long as the promise is not too high

- ▶ Some opportunities are forgone (even though profitable)



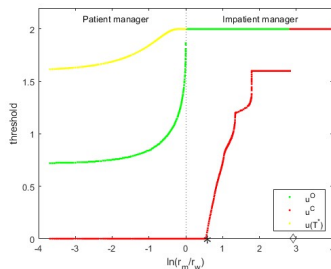
Slightly Impatient Manager

- ▶ Incentives: unconditional immediate time interval with $\varphi = 1$
 - ▶ prolonged when new opportunities are incentivized
- ▶ Incentivize effort as much as possible



Sufficiently impatient manager: Performance-based seniority

- ▶ **Junior:** max effort, $\alpha = 1$; no compensation, $\varphi = 0$
- ▶ **Intermediate:** Effort: $\alpha = 1$
 - ▶ Compensation: guaranteed $\bar{\varphi} \in (0, 1)$ + temporal increases to $\varphi = 1$ (unconditional immediate time intervals of $1 - \bar{\varphi}$)
- ▶ **Senior:** no effort, $\alpha = 0$; max compensation, $\varphi = 1$.



- ▶ “Promotion” times depend on the arrival of opportunities
- ▶ If the manager is extremely impatient - no intermediate level

Organizational Implications

Interdependence of contracts within an organization:

- ▶ Patient manager ($r_m < r_w$) improves value
- ▶ Impatient manager ($r_m > r_w$) improves retention
- ▶ Indirect effects of using promotions as incentives

Value of managerial discretion:

- ▶ Manager's value decreases as arrival of opportunities becomes more volatile.

Observable vs. Concealable opportunities:

- ▶ Consider a "patient organization" ($r_o < r_m, r_w$)
 - ▶ discontinuity at $r_m = r_w$ under observable opportunities
 - ▶ A (slightly) impatient manager who does *not* observe opportunities can outperform one who does

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Final remarks

Relational Contracting

- ▶ Patient manager: manager-preferred equilibrium is either identical to or a slight modification of the optimal contract.
- ▶ Impatient manager: "senior rank" must change.
 - ▶ observable opportunities: senior workers exert some effort
 - ▶ concealable opportunities the performance based seniority system has only two tiers. The threshold $u^O < \frac{1}{r_w}$.

Storable Opportunities

- ▶ Impatient managers want to frontload effort – no storing
- ▶ Patient manager benefits from smoothing opportunities - if there is no depreciation. If stored opportunities depreciate and difference in discounting is small, storage is suboptimal.

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Related Literature

- ▶ Hierarchical structure of the firm: Williamson 67; Calvo and Wellisz 78,79; Rosen 82; Macafee and McMillan 95; Melumad, Mookherjee and Reichelstein 95; Cameron, Freeman and Mishra 91; Thomas and Dunkerley 99; Garicano 00; Harris and Raviv 02; Hart and Moore 05.
- ▶ Contracting with random opportunities: Li, Matouschek and Powell 17; Bird and Frug 19, 21; Forand and Zapal 20; Lipnowski and Ramos 20.
- ▶ Optimal timing of compensation: Lazear 81; Carmichael 83; Sannikov 08; Garrett and Pavan 12, 15.
- ▶ Contracting with different discounting: Opp and Zhu 15; Frankel 16; Krasikov, Lamba and Schacherer 20; Hoffmann, Inderst and Opp 21.