Understanding the Foundations of Institutions:
Moral Hazard in High Office

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http://home.uchicago.edu/~rmyerson/research/knight.pdf

Papers:

"The autocrat's credibility problem and foundations of the constitutional state,"
American Political Science Review 102 (2008), 125-139.

"Leadership, trust, and power: dynamic moral hazard in high office,"
http://home.uchicago.edu/~rmyerson/research/power.pdf
http://home.uchicago.edu/~rmyerson/research/es2009.pdf

"Fundamental theory of institutions: a lecture in honor of Leo Hurwicz," *Review of Economic Design 13* (2009), 59-75.

Revisiting Frank Knight's theory of *Risk, Uncertainty, and Profit*

"The entrepreneur's income... may be distinguished from the contractual returns received for services not involving the exercise of judgment, and which are paid by the entrepreneur..." Knight (1921, p 280).

Knight saw the profit-motivated activity of entrepreneurs as fundamental to social progress and organization.
Profits are rewards to "uncertainty" rather than "risk."

LeRoy and Singell (*JPE*, 1987) interpret Knight's profits as rewards for bearing hazards that are uninsurable due to moral hazard and adverse selection (not to any lack of subjective probabilities).
Barzel (*EI*, 1987) also sees moral hazard as central to Knight's theory of the firm.
Langlois and Cosgel (*EI*, 1993) argue that key to Knight's thesis is in the vital judgments that entrepreneurs must make to earn their profits.

Unified view: Getting appropriate judgments is a central moral hazard problem in any organization.
Focusing here on political entrepreneurship, instead of economic, will free us of questions about adjudication of contracts in an external court.
Focusing on moral hazard instead of adverse selection will let us explain concentration of privileges without assuming prior inequality of people's types.

Court of the Exchequer: vital institution of English government
Richard FitzNigel's <u>Dialogue of the Exchequer</u> (c. 1180):

Why is the Exchequer so called? ...Because the table resembles a checker board...
Moreover, just as a battle between two sides takes place on a checker board,
so here too a struggle takes place, and battle is joined chiefly between two persons,
namely the Treasurer and the Sheriff who sits to render account,
while the other officials sit by to watch and judge the proceedings.

Diagram of the Exchequer Table.

Xenophon's *Education of Cyrus* (from book 1, chap 3)

Cyrus founded the Persian Empire with an essential essential quality of leadership: a reputation for reliably rewarding good service.

When at dinner with his daughter and [her son] Cyrus, Astyages [King of Media] wished the boy to dine as pleasantly as possible. He thus put before him fancy side dishes and all sorts of sauces and meats.

Astyages said, "Does it not seem to you that this dinner is much finer than among the Persians?"

To this Cyrus answered, "No, grandfather, for the road to satisfaction is much more simple and direct among us [Persians] than among you [Medes]."

Astyages said, "Feast at least upon these meats, so that you may go home a vigorous youth."

Cyrus said, "Are you giving me all this meat, grandfather, to use however I want?" "Yes, my child, by Zeus I am," he said.

Then Cyrus, taking the meat, distributed it to his grandfather's servants and said to each, "This is for you, because you teach me to ride with enthusiasm; for you, because you gave me a javelin; for you, because you serve my grandfather nobly; for you, because you honor my mother."

He proceeded like this until he had distributed all the meat that he received.

(Cyrus later usurped the throne of Media.)

Foundations of the state: distribution of moral-hazard rents and patronage

Moral-hazard problems are fundamental in any institution.
Motivating officials to enforce institutional rules is a moral-hazard problem.

Government is a network of agents with broad powers, imperfectly monitored.
Government agents (governors) could profit from abusing power,
   and so they must expect greater long-run rewards from good service.
Candidates would be willing to pay for such highly rewarded offices.
   (Becker-Stigler, *J Legal Studies* 1974.)

Agents' rewards depend on judgments of their superiors in the network, and so
   incentives ultimately depend on top leaders. (Alchian-Demsetz, *AER* 1972.)
Promises of back-loaded rewards become a debt owed by the state,
   which leaders could be tempted to repudiate.
When a high official is dismissed, his valuable office can be re-sold.

So courtiers must monitor the distribution of offices and rewards.

Any organization must promise performance-contingent rewards to its agents, who
   must trust the organization to implement the terms of these debts appropriately.
Costs of maintaining this circle of trust may cause organizational officials to
   become an entrenched privileged elite.

An extension of the Becker-Stigler model of controlling a governor

[Ex: α=0.1, β=0.3, γ=1, D=5, δ=0.05, K=1, H=25]

At any time, governor can behave well, or misbehave, or rebel
(except during short visits to court).

The expected payoff value for a governor who rebels is D.
Candidates for governor have only some limited assets K, where $0 \le K < D$.

The leader cannot directly observe whether a governor is (mis)behaving, but he
can observe costly crises that occur at a Poisson rate α when gov'r behaves well,
or at a Poisson rate β when gov'r misbehaves, where $\beta > \alpha > 0$.
(While behaving, in any time interval ε, $P(\text{crisis}) = 1 - e^{-\varepsilon\alpha} \approx \varepsilon\alpha$ if $\varepsilon \approx 0$.)
Misbehavior also gives governor additional hidden benefits worth γ per unit time.

Each individual is risk neutral and has discount rate δ.

The leader could free himself of debts to a governor by sacking the governor.
Let H be the upper bound on what the leader can be trusted to owe a governor.
This parameter H is our representation of moral hazard at the top.

Crises and rebellions are very costly for the leader,
so he wants his governors always to behave well, never rebel.
Objective: minimize leader's E(costs) of such incentives.

Optimal plan for paying governors of a province

[Rebellion payoff $D=5$, crisis rates $\alpha=0.1 < \beta=0.3$, misbehavior benefit $\gamma=1$,
    discount rate $\delta=0.05$, candidates' assets $K=1$, leader's trust bound $H=25$.]
[The objective is to minimize the leader's expected discounted cost of paying gov'rs
    subject to incentive constraints of good behavior and no rebellion.]

Dynamic state is the governor's credit: $U(t) = $ (expected present value of future pay).

To deter misbehavior, must expect credit to drop by $\tau = \gamma/(\beta-\alpha) = 5$ after any crisis.

To avoid rebellion, need $U(t)-\tau \geq D$ after crisis, so need $U(t) \geq D+\tau = 10$ before.
A new governor gets initial credit $U(0) = G = D+\tau$, after paying $K=1$ for promotion.

If $U(t)-\tau < G$ then, after a crisis, the governor must be called to court for trial,
    to be reinstated at credit G with probability $(U(t)-\tau)/G$, or else dismissed to 0.

Back-loading pay is better whenever possible.
When credit $U(t) < H$, governor gets no pay, credit grows at rate $U'(t) = \delta U(t)+\alpha\tau$.
When $U(t)=H$, the governor is paid at rate $\delta H+\alpha\tau$, with $U'(t)=0$ until the next crisis.

So the leader's credit bound H is regularly binding in the optimal solution.
Increasing H strictly decreases the leader's expected discounted costs ex ante.
But ex post, the leader incurs large debts to his high officials.

Example: Let $\delta = 0.05$, $\alpha = 0.1$, $\beta = 0.3$, $\gamma = 1$, $D = 5$, $K = 1$, $H=25$.
Then $\tau = \gamma/(\beta-\alpha) = 5$, $G = D+\tau = 10$, Initial E(costs) = $V(G)-K = 10.44$,
Steady state: $P(u=H) = 0.68$, E(PayRate) = 1.19, E(DismissalRate) = 0.00030 .
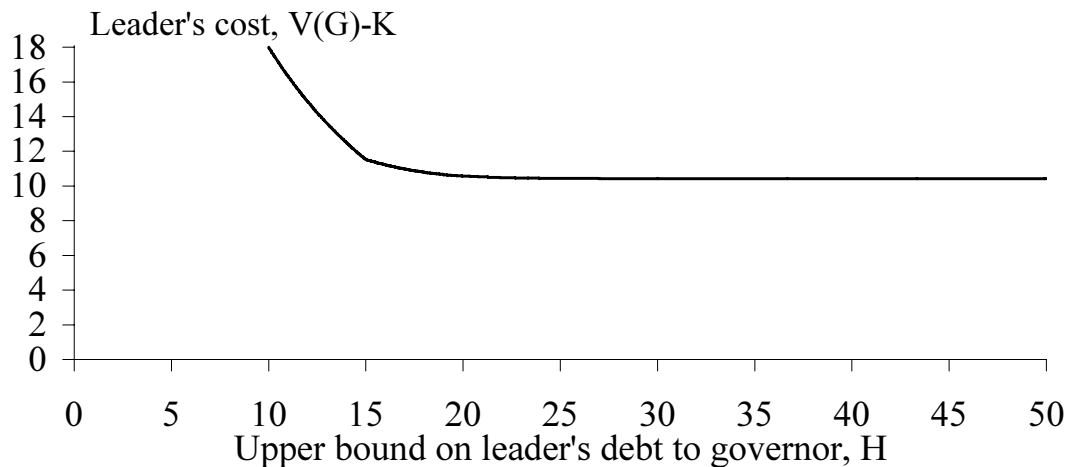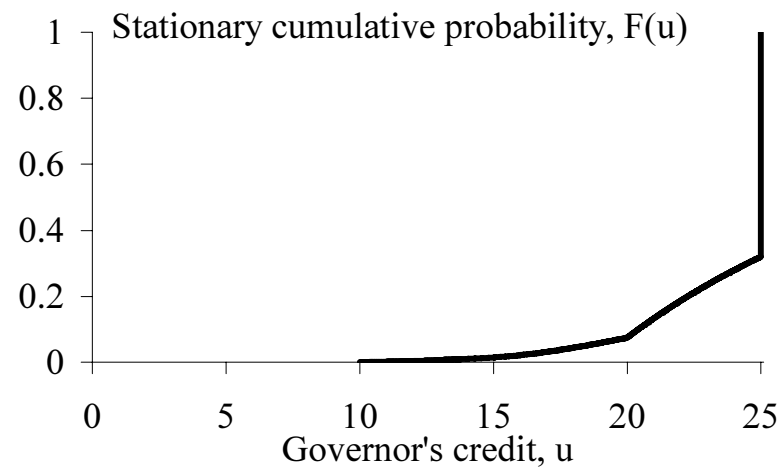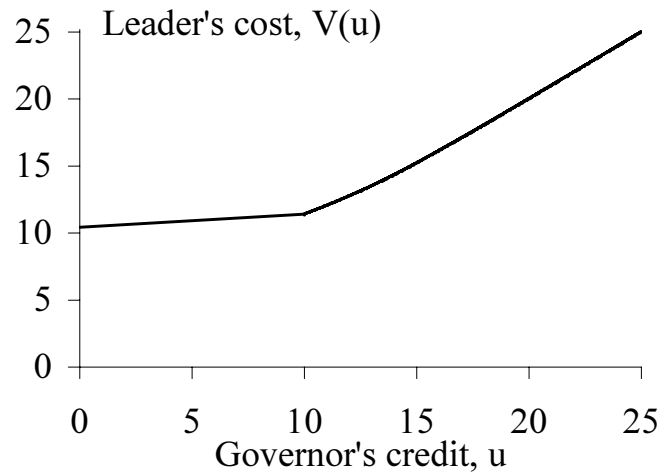
Increasing H from 10 to ∞ could reduce initial Ecosts $(V(G)-K)$ from 18 to 10.42.
With H=10=G, get pay $\delta G+\alpha\tau=1$, dismiss-rate $\alpha(1-(G-\tau)/G)=0.05$, $V(G)-K=18$.

Interpreting the solution

Like a banker, a leader's promises of future credit must be trusted and valued as
  rewards for current service. The leader must be a trusted debtor to his agents.
But these debts need enforcement, so an effective leader must create institutions that
  give his agents power to enforce these debts, to solve moral hazard at the top.

Officials must sometimes be dismissed, but randomly to not provoke rebellion.
In this randomization, the leader actually prefers to dismiss and re-sell the office.
So the trials must be monitored by people who can punish the leader for cheating.

In supreme political institutions of the state, who has such power to punish a leader?
The other high officials who sustain the state together have such power, if they share
  a sense of identity that would cause them all to lose trust if he cheated any one.
So in a leader's court, his reputation for reliably judging and rewarding his agents
  can be collectively guarded by his agents and courtiers. (Court of Exchequer.)

Turnover losses (G−K) would vanish if commoners could trust the leader to protect
  deposits earning interest δ until they grow to G and can buy a governorship.
Key assumption: Commoners trust the leader less than high officials (K<G<H).
Many rulers have held power without much trust from common people,
  but no one can rule long without trust from high officials of his government.
So privileged aristocracy can be derived from a scarcity of trust (in state of nature).

Captains' trust of their leader in contests for power

My "Autocrat's credibility problem" (*APSR* 2008) focuses on a leader's need for
   supporters (captains) to help him compete for power in establishing his state.
Initial supporters must be motivated by expectation of future rewards if they win.

But a leader's promises would be doubted if nothing could constrain him to fulfill
   past promises when his rivals have been defeated.
A strong competitive leader needs some institutional court where his promises to
   supporters can be credibly enforced.
Supporters can constitute such a court when they share group identity and norms
   so that, if he cheated any one of them, then he would lose the trust of all.

Main result: In negotiation-proof equilibria of sequential contests for power, a
   contender cannot recruit supporters without a court where they can depose him.

The state's captains and governors are like a firm's investors and managers:
   all need some institutional protection for their promised future rewards.
Shared group identity can define organizational boundaries.

A model of contests for power

On an island, the winner of the most recent battle is the ruler and gets income R.

Battles occur when new challengers arrive, at a Poisson rate λ.

    (In any time interval ε, P(challenger arrives) = $1-e^{-\varepsilon\lambda} \approx \varepsilon\lambda$ if ε≈0.)

A leader needs support from captains to have any chance of winning a battle:

    Pr(leader with n supporters wins if rival has m) = $p(n|m) = n^s/(n^s+m^s)$.

    This is a standard contest success function with parameter s≥1.

A captain's cost of supporting a leader in battle is c.

Leaders and captains are risk neutral and have discount rate δ.

Consider a leader with n supporters, expecting all rivals to have m supporters.

If leader promises income y to each supporter then, when there is no challenger,

    a supporter's expected discounted payoff is $U(n,y|m) = (y-\lambda c)/[\delta+\lambda-\lambda p(n|m)]$.

For the captains to rationally support in battle, $p(n|m) U(n,y|m) - c \geq 0$.

Lowest y satisfying this participation constraint is $Y(n|m) = (\delta+\lambda)c/p(n|m)$.

The leader's expected discounted payoff is:

$V(n,y|m) = (R-ny)/[\delta+\lambda-\lambda p(n|m)]$ when he rules without challenge,

    $W(n,y|m) = p(n|m)V(n,y|m)$ on the eve of battle.

With optimal wage scales, the leader gets $v(n|m) = V(n,Y(n|m)|m)$ in peacetime,

    $w(n|m) = W(n,Y(n|m)|m)$ on eve of battle.

Forces that can be credibly recruited under different types of regimes

An absolute leader can cheat anyone without others reacting (so y independent of n).
Against m, a force of n captains is ***feasible for an absolute leader*** iff there is an
    income y such that $y \geq Y(n|m)$ and $V(n,y|m) \geq V(k,y|m) \ \forall k \leq n$.
<u>Fact.</u> If n is feasible for an absolute leader with incomes y then there exists k>n
    such that $v(k|m) > V(n,y|m)$ and $w(k|m) > V(n,y|m)$.
An absolute leader could always benefit from committing to maintain a larger force.

When captains (courtiers) communicate at the leader's court, an unjustified dismissal
    of one captain could cause all others to lose trust of the leader.
Against m, a force size n is ***feasible with a weak court*** iff
    $v(n|m) \geq v(0|m) = R/(\delta+\lambda)$.
<u>Fact.</u> If m is weak-court feasible against m, then some n>m yields $w(n|m) > w(m|m)$.

In a strong court, loss of confidence at court could stimulate challenges and cause the
    leader's downfall. Against m, n is ***feasible with a strong court*** iff $v(n|m) \geq 0$.

A force m is a ***negotiation-proof equilibrium*** iff $w(m|m) = \max_{n \geq 0} w(n|m)$,
    so any new leader before the first battle would want the same force size m.
<u>Fact.</u> If m is a negotiation-proof equilibrium, then no positive force n>0 is feasible
    against m for an absolute leader or a leader with only a weak court.
A leader needs a strong court to recruit the optimal force m in this equilibrium.
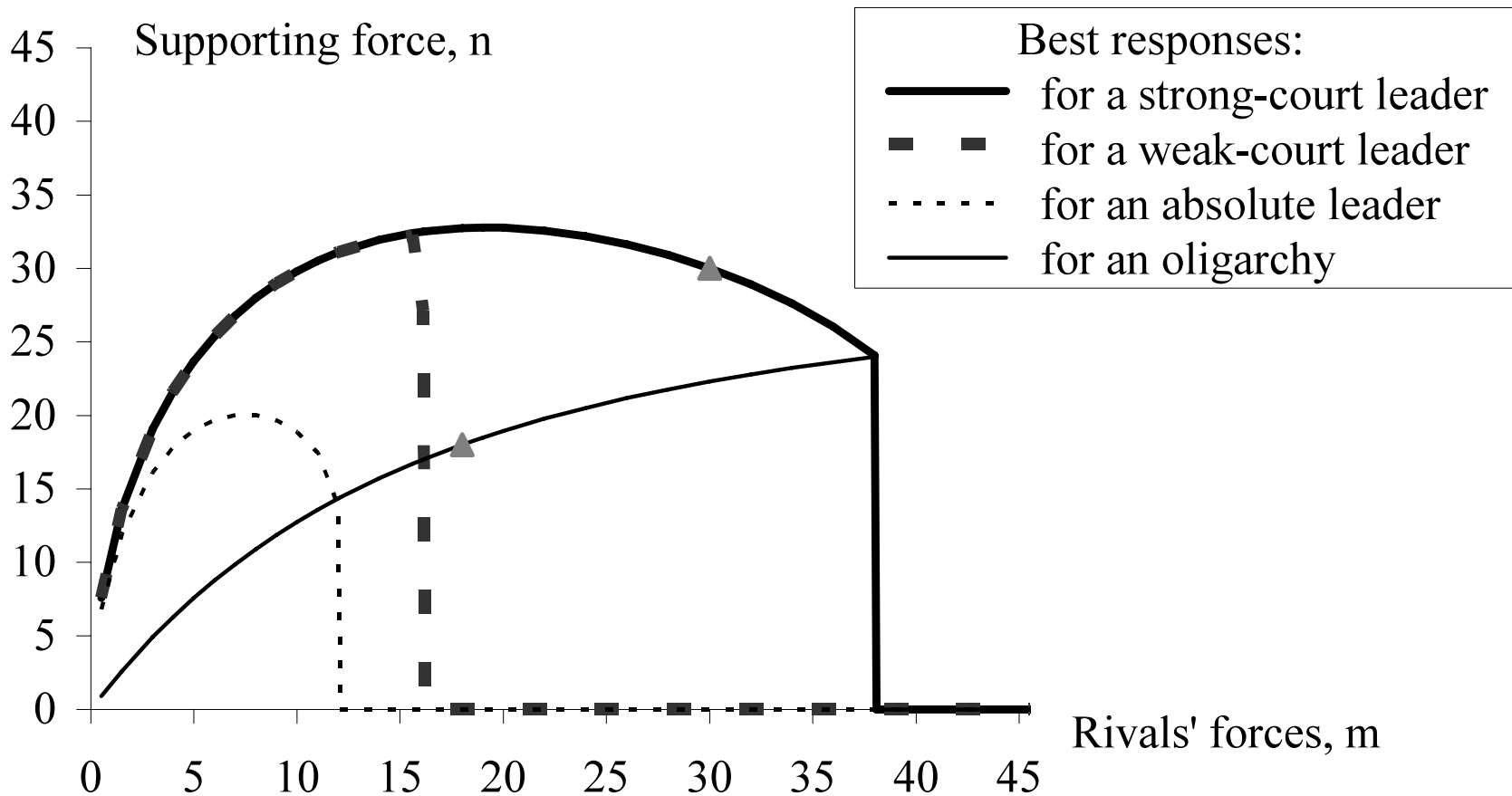
Example: Optimal supporting forces for different regimes against anticipated rival forces, when R=90, δ=0.05, λ=0.2, c=5, and s=1.5.

A leader wants his force n to maximize w(n|m) over all n feasible for him.
(In an oligarchy, the optimal force n would maximize w(n|m)/n.)

The arc of the moral universe is long, but it tends toward justice

Constitutional constraints are not the fragile creation of modern democrats.
To recruit the support that is needed to win power in a competitive political system,
    a leader must be credibly constrained to keep his promises to his supporters.
They need a forum for communicating grievances against their leader, and they need
    a sense of group identity so that they'd all react if any one of them were cheated.
Participation in court may be required, as well as support in battle ("aid & counsel").

The patterns of behavior that a leader must maintain to keep his supporters' trust may
    be regarded as an informal *personal constitution* for the leader.
This personal constitution requires the leader to appropriately reward supporters, but
    other forms of behavior may be required.
A leader may fear to violate a formal constitution when his political relationships
    were developed in its context, so that violating it would shock his supporters.
So constitutional democracy may be based on supporters' fragile trust of their leader.
But a new constitution cannot make leaders violate their personal constitutions.

In these models, we see a force towards both inequality (moral-hazard rents) and
    justice (appropriate judgment) as equally fundamental and essentially linked.
Constraints of law in the allocation of elite privileges are essential fundamentals in
    the institutions on which we all rely.

Vulnerable financial institutions

I have emphasized the political system, but moral hazard is also an essential concern
in a financial system that allocates vast amounts of other people's wealth.
Moral-hazard rents make trusted bankers a privileged elite, but in a regulatory
framework where privileges depend on good performance.

Back-loaded moral-hazard rents: Trust-worthiness of agents today depends on
expectation of their benefiting more from trust in future.
So trust is a coordination game with the future, and it must have arbitrary equilibria.

To justify nonmonetary aspects of Fisher's ('33) debt-deflation theory of depressions,
Bernanke ('95) cited agency-theoretic requirements of collateral for transactions.
When deflation ruins debtors, the largest debtors are trusted financial intermediaries.
Their loss of functional status cuts others' ability to profitably invest, causing
substitution of inefficient bureaucratic-governmental control of investments.
Macro multipliers from moral hazard in general equilibrium? Models are needed...

When we see lost reputations as key, how can we restore a system of trust?
Redistribute positions of financial power and privilege?
Reform the institutional system that regulates them?
Economic theory traditionally focused on impersonal prices and market aggregates,
but trust is built on individual reputations and status under recognized rules.

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