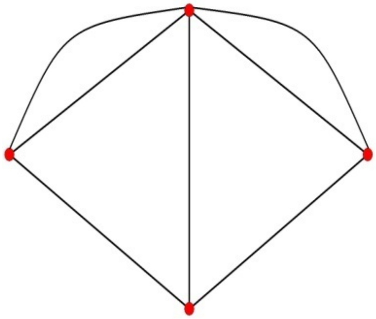
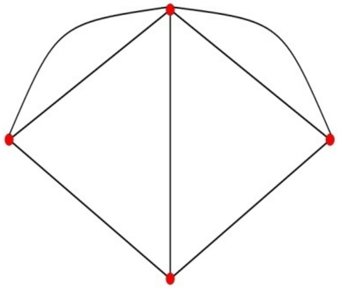


Inducing Leaders to take Risky Decisions: Dismissal, Tenure, and Term Limits

Philippe Aghion Matthew O. Jackson

``If General McClellan isn't going to use his army, I'd like to borrow it for a time.''
Abraham Lincoln, Jan 10, 1862, before relieving McClellan of command (for the first time).

Introduction



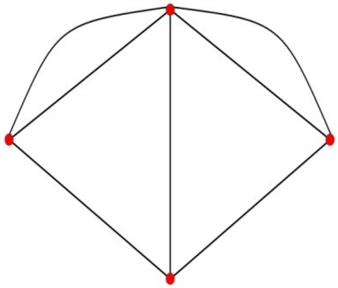
- How can we motivate individuals who have discretion without adjustable monetary compensation?
  - political leaders (Hollande..)
  - Judges
  - state employees (some faculty, military...),
  - wealthy CEOs…

- **No effort – just discretion**

- **Firing/replacement as incentives**

- Insights into tenure, term limits, …?

Literature

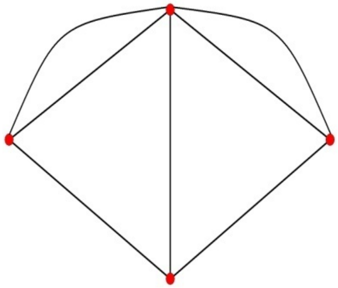


- Match quality labor: ***Jovanovic (79)***

- Reputations, career concerns, *signalling*: Holmstrom (82), ***Banks & Sundaram (93, 98), Besley & Case* (95),** Tirole (96), Dewatripont, Jewitt, Tirole (99ab), Tadelis (99), Taylor (00), Mailath and Samuelson (01, 06)..

- Tenure: Kahn & Huberman (1988), Carmichael (1988), Waldman (1990), Burdett and Coles (2003)

Here



- Leader has discretion over actions:
  - safe decision
  - risky decision

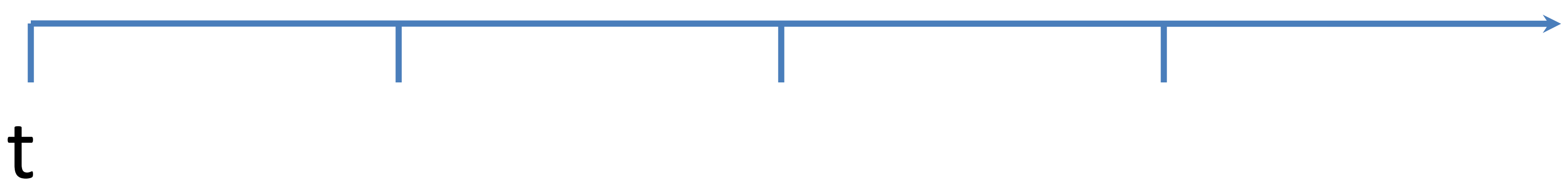
- Competent leaders can pick better risky decisions

- Replacing leaders has subtle incentive issues:
  - Leaders may avoid decisions that reveal competence...
  - Threat to replace can lead to inaction: how to motivate?

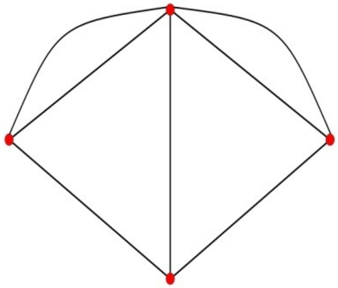
Timeline

Discrete periods t in {1,2,…., }

Leader sees S_t	Leader chooses x or y	Principal observes some info	Replacement Decision



Payoff to Principal/Voter

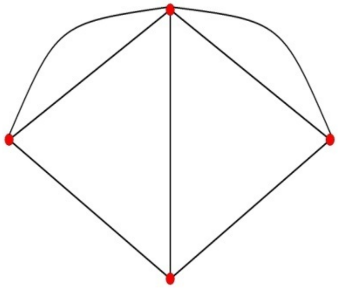


- State ω_t in {X, Y} equally likely (iid over time)

- $v>1$:

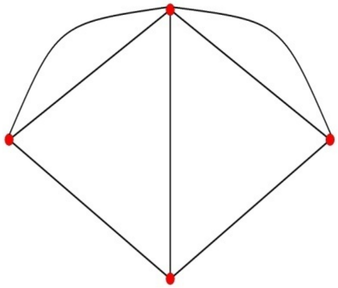
		STATE	
		X	Y
ACTION:	*x*	0	0
	y	-v	1

Leader



- Leader is either
  - competent with probability λ_0
  - incompetent with probability $1-\lambda_0$
- Signal S_t in {X,Y}
- Competent: sees $S_t = \omega_t$ with prob $p > 1/2$
- Incompetent: sees $S_t = \omega_t$ with prob 1/2

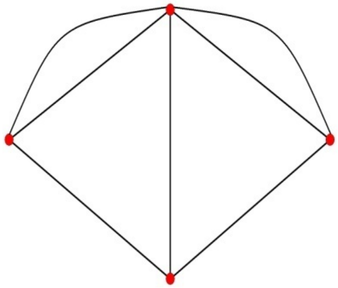
Leader's Payoffs/Beliefs



- Leader benefits **b**/period from being in office

- Same starting beliefs as principal/voter

Some Useful Expressions



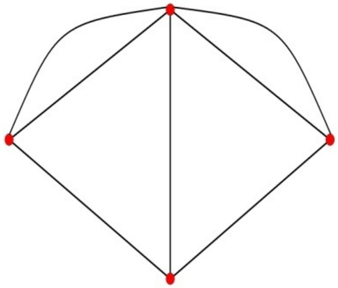
- Expected probability of leader's signal being correct:

$$f(\lambda_t) = \lambda_t\, p + (1 - \lambda_t)\, \tfrac{1}{2}$$

- Expected payoff to principal if leader follows signal

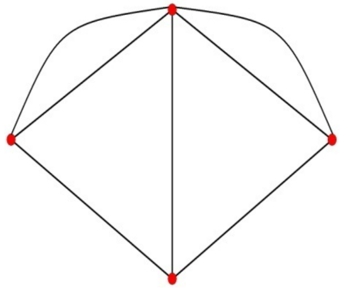
$$u(\lambda_t) = \tfrac{1}{2}\, [f(\lambda_t) - (1 - f(\lambda_t))v\,]$$

Replacement



- Based on history:
- Choose to **K**eep or **R**eplace – get new draw on leader
- Cost of replacement c□0

Information



- Part I - Principal observes state, signal and payoff in each period
- Part II – Principal observes only payoff in each period:
  - Full commitment
  - Voting

Histories

- h^t the history of observations through time t

- Part I: $h^t = (\omega_1, S_1, a_1, d_1; \ldots ; \omega_t, S_t, a_t, d_t)$

- Part II : $h^t_P = (u_1,d_1;\ldots; u_t,d_t)$

  $h^t_L = (u_1,d_1;\ldots; u_{m-1},d_{m-1};$
  $S_m, u_m, d_m ;\ldots S_t, u_t, d_t)$

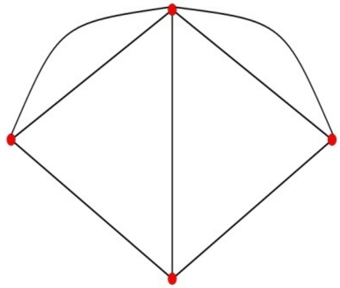
- $H = \{ h^t : t \in \{1,2,\ldots\} \}$

Strategies

Voter/Principal $\square_V(h^t_P)$ □ □{ K, R }

Leader $\square_L(h^t_L)$: {X,Y} □ □{x,y}

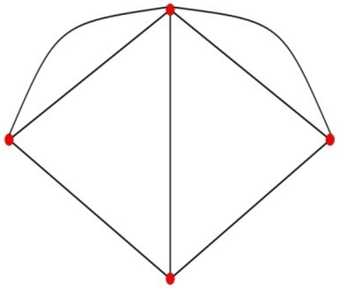
Outline



- Part I - Observe state, signal and payoff at end of each period

- Part II – Observe payoff at end of each period
  - Full commitment
  - Voting

Leader's Strategy



- For part 1, presume leader follows signal (refinement…)
- For part 2, depends…

Principal's Optimal Strategy

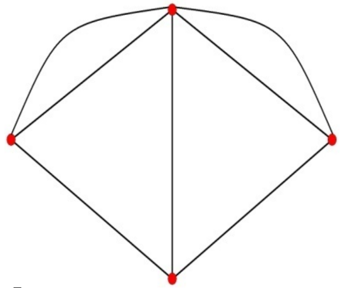
- Cutoff belief $\lambda(c)$

λ_t

- Keep leader as long as λ_t □ $\lambda(c)$

- Replace if $\lambda_t < \lambda(c)$

Conjecture

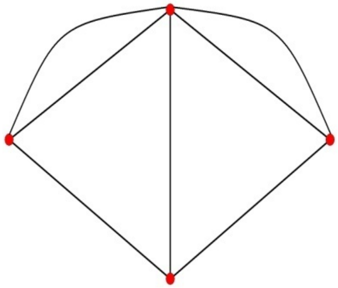


- Replacement probabilities can be ``bell shaped'':
  - Initial `honeymoon': wait for enough failures given cost,
  - Intermediate: highest turnover period
  - Eventually: long survival implies high likelihood competent
- But this depends on p…
  - Low p: actions not very revealing, slow learning and bell shape
  - High p: actions very revealing, fast learning and decreasing

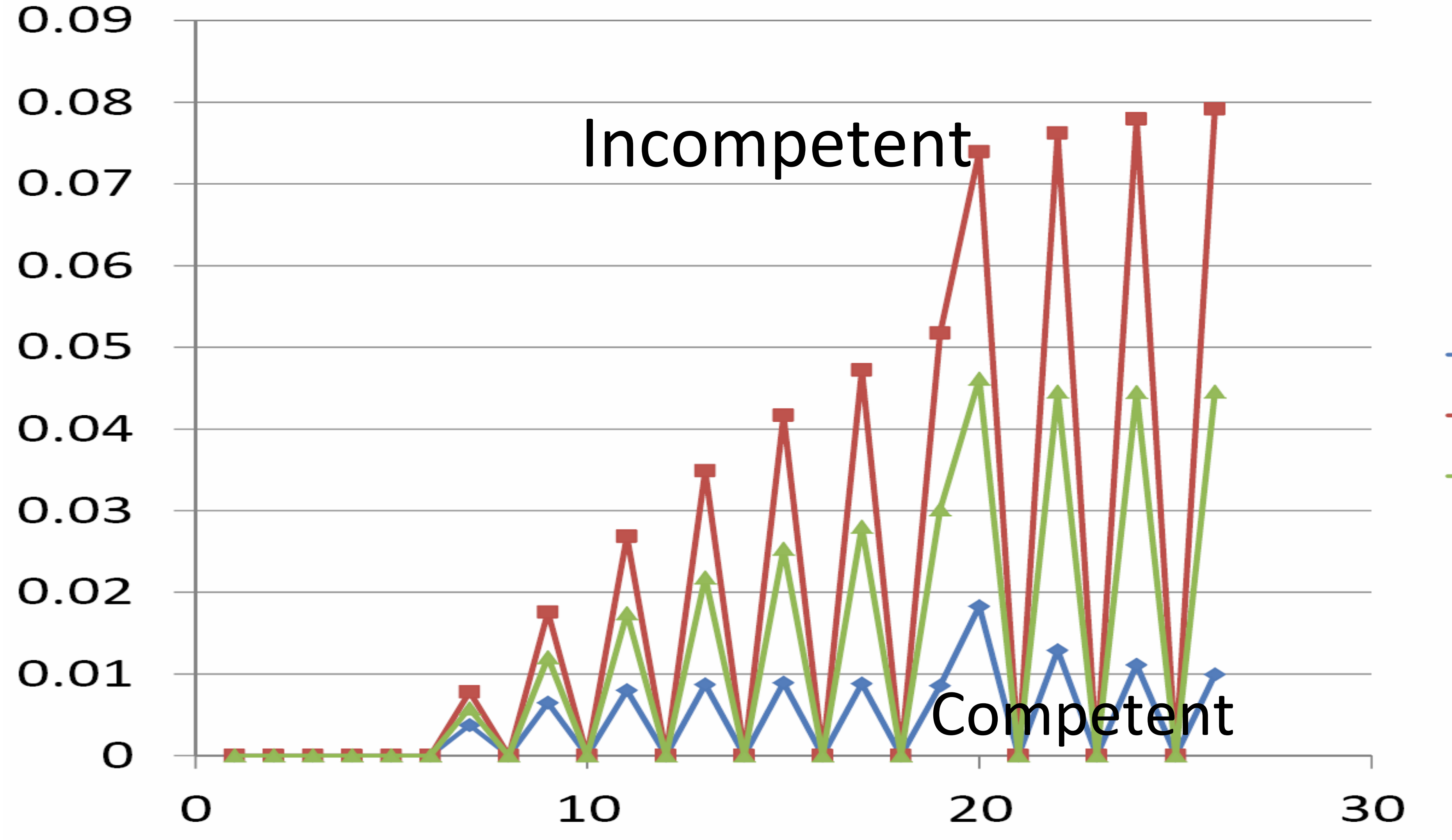
Proposition

- Let P(u) be the probability that principal replaces the leader in period u but kept her until then
- Suppose that principal retains the leader at the end of period u iff λ_u □ $\lambda(c)$ for some $\lambda(c) < \lambda_0$
- Then there exists $t>1$ such that $P(t)>0$ while $P(t+1)=0$ and $P(t+k)>0$ for some $k>0$.

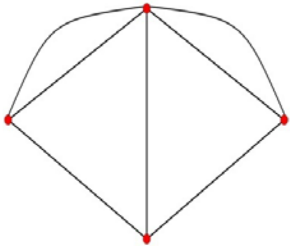
Example: Replacement Pr



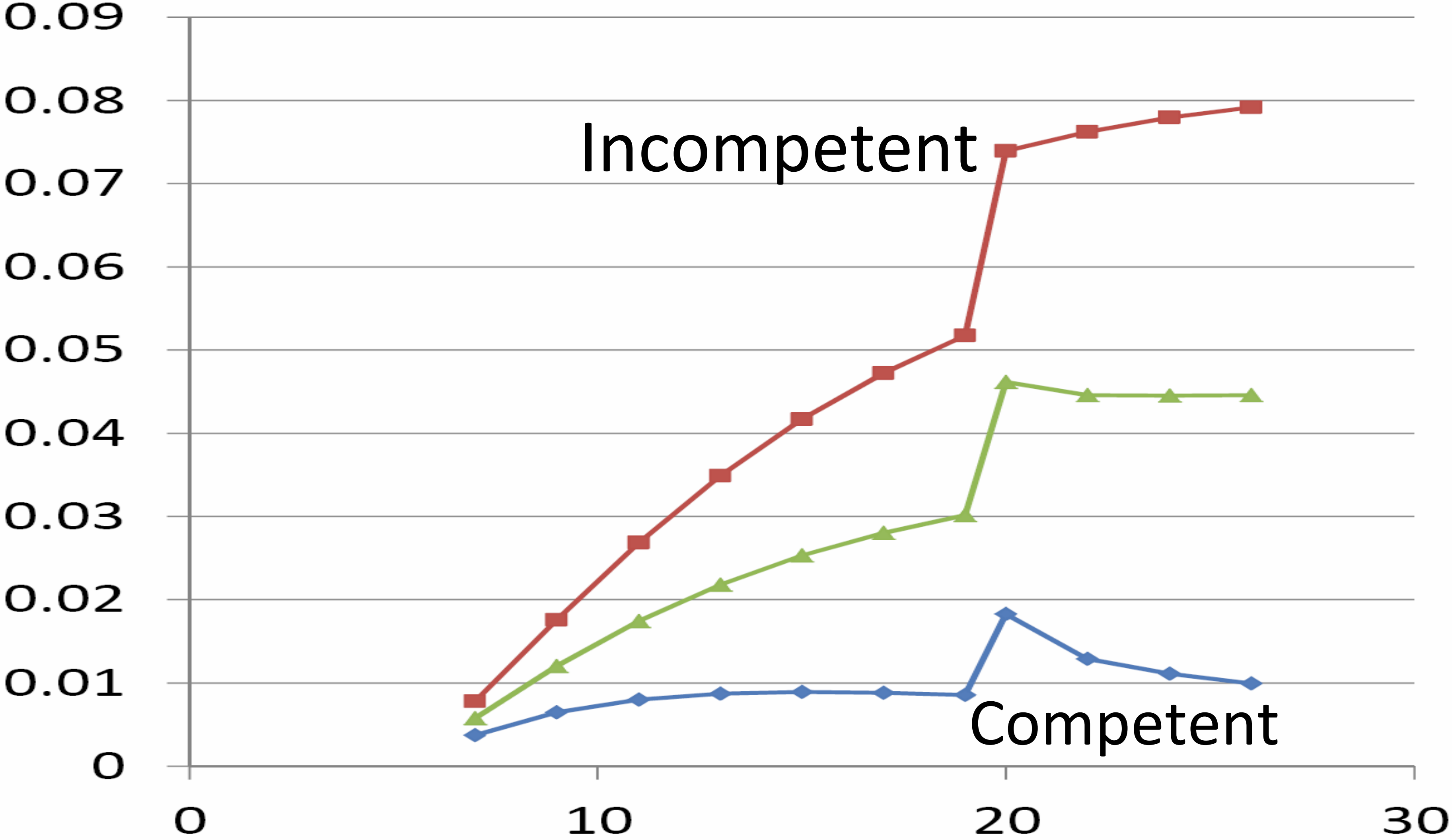
$\lambda_0 = 1/2 \quad \lambda(c) = 1/3$ p=.55



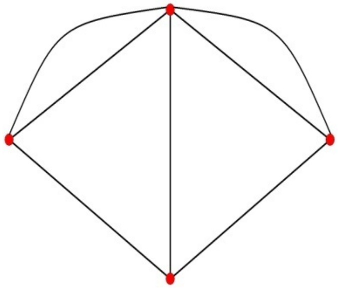
Example: Replacement Pos. Dates



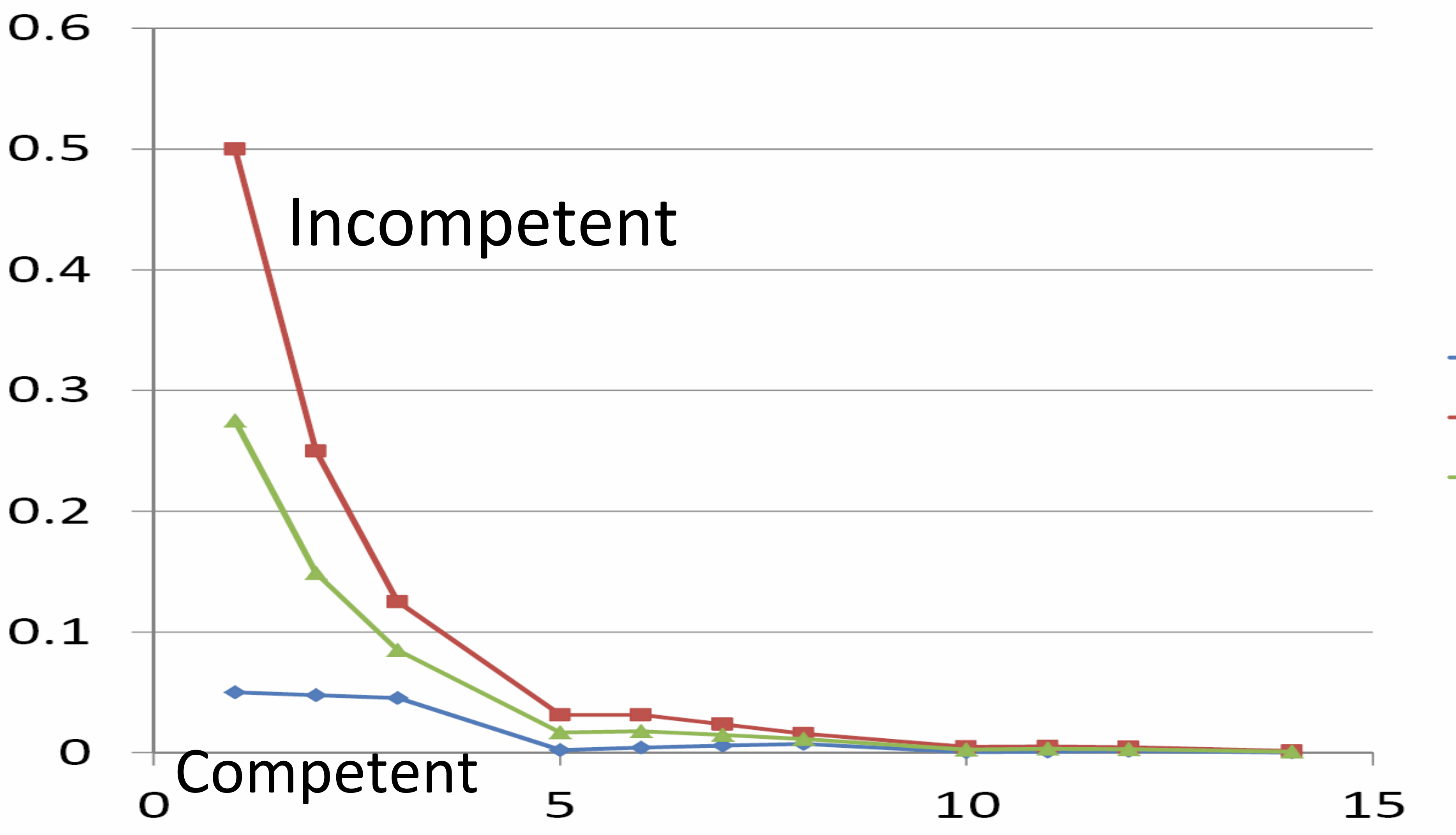
$\lambda_0 = 1/2 \quad \lambda(c) = 1/3 \quad p=.55$



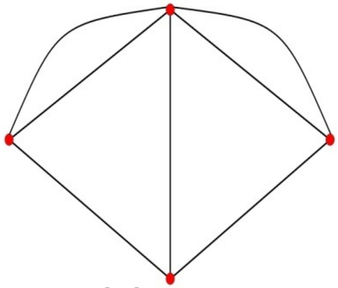
Example: Replacement Pr



$\lambda_0 = 1/2 \quad \lambda(c) = 1/3 \quad p=.95$

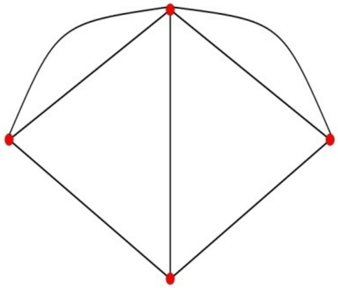


Summing up



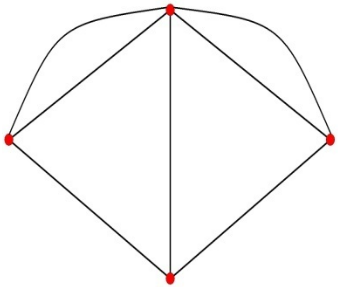
- Replacement probability shows sawtooth pattern
- Replacement probabilities (restricting to positive probability dates) tend to be ``bell shaped'':
  - Initial `honeymoon': wait for enough failures given cost,
  - Intermediate: highest turnover period
  - Eventually: long survival implies high likelihood competent
- But this depends on p....
  - Low p: actions not very revealing, slow learning and thus replacement probability truly bell shaped
  - High p: actions very revealing, fast learning, and thus replacement probability essentially decreasing

Outline



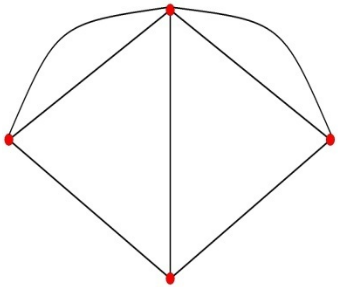
- Part I - Observe state, signal, and payoff at end of each period
- Part II – Observe payoff at end of each period
  - Full commitment
  - Voting

Commitment



- Start with two periods to get basic intuitions

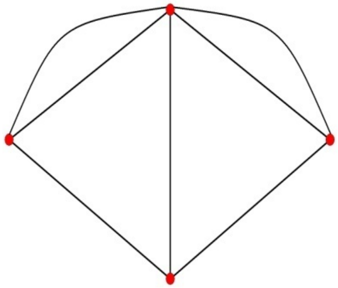
Two Periods



- Two ways to motivate
  - Carrot: immediate tenure – never replace
  - Stick: replace after failure in the first period, *or with some probability after taking action X*

- Optimal mechanism depends on cost of replacement

Two Periods



- Stick incentives:
  - Prob retained if choose y given Y signal: $f(\lambda_0)$
  - So need probability retained given X: $\leq f(\lambda_0)$
- Given costs of replacement this binds

Proposition

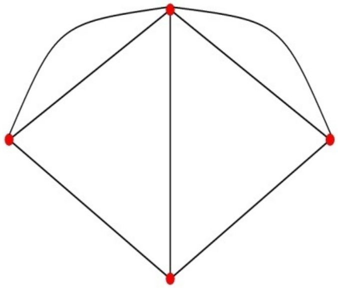
. There is a cutoff value $c(\lambda_0,p,v)$ such that the optimal mechanism for the principal is:

-if $c > c(\lambda_0,p,v)$ then grant immediate tenure

-if $c < c(\lambda_0,p,v)$ then fire leader if Y and fails, keep leader if Y and success, and keep leader with prob $f(\lambda_0)$ if chooses X

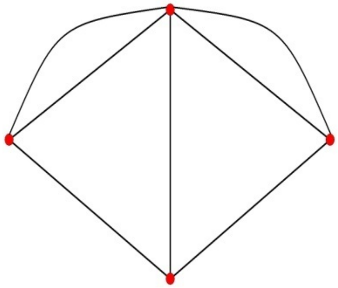
. The cut-off $c(\lambda_0,p,v)$ is increasing in p and v, and inverted-U shaped in λ_0

Three Periods



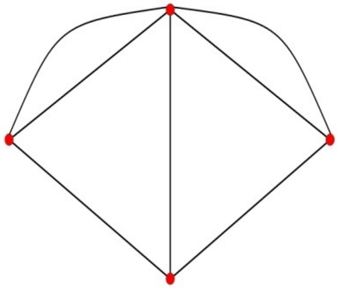
- Stick: random replacement every period
- Partial Carrot: probationary tenure
- Full carrot: immediate tenure

Three Periods



- (low c) Stick: random replacement every period dominates
- (med c) Partial Carrot: probationary tenure dominates
- (high c) Full carrot: immediate tenure dominates

Infinite Periods



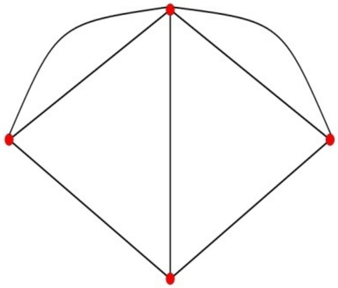
- With many periods and commitment, what mechanisms are (approximately) optimal?

Tenure Mechanism

Let T, N, F, such that keep the leader for T periods then decide on tenure:

- if the leader took Y exactly N times out of T and had at least F successes, keep the leader forever
- otherwise fire the leader and start over with a new leader

Tenure Theorem



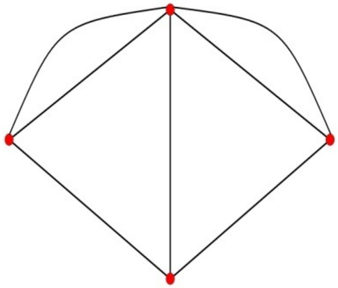
For any ε>0 there exists $\bar{□}$<1 and a tenure mechanism such that if □≥$\bar{□}$ then in all sequential equilibria of the mechanism the principal's ex ante expected utility is at least 1-ε times u(1)/(1-□).

So, for patient principals a tenure mechanism is almost as good as having a competent leader forever.

Intuition

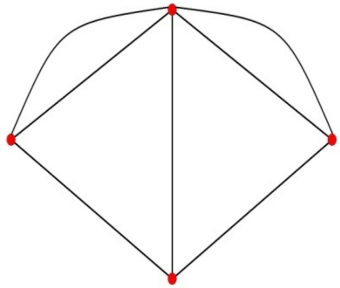
- Tenure gives good incentives both in the test period and in the forever after (given that effort is not an issue)
- And so with lots of patience and long horizons one fires all incompetents and only tenures a competent leader and then keeps her forever once she is found to be so.

Summary: Commitment



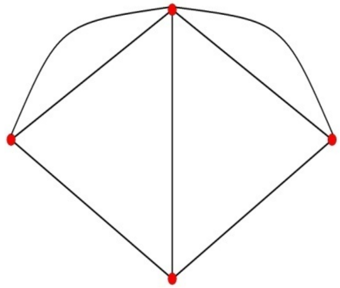
- If impatient:
  - low costs, use stick: fire conditional on failure or X (mix)
  - high costs, use full carrot: early tenure (and possibly inactive leader)
- If patient:
  - probationary tenure: after trial period evaluate and keep or replace based on substantial data

Outline



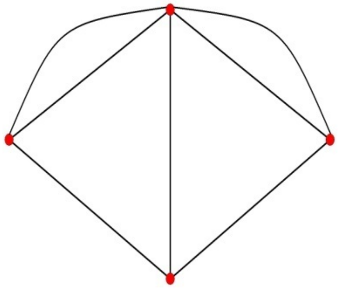
- Part I - Observe state, signal, and payoff at end of each period
- Part II – Observe payoff at end of each period
  - Full commitment
  - No commitment (voting)

No commitment (voting)



- Call principal who cannot commit a “voter”
- Abstract from voter biases – just care about competency
- A representative `voter’ chooses whether to replace the leader after each period

A Benchmark

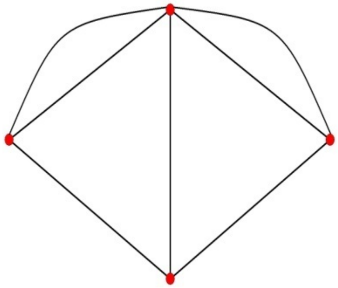


Payoff if replace the leader in every period

Value from any period onwards:

$$V_1 = (u(\lambda_0) - \square\ c) \ / \ (1 - \square)$$

Markov Strategies

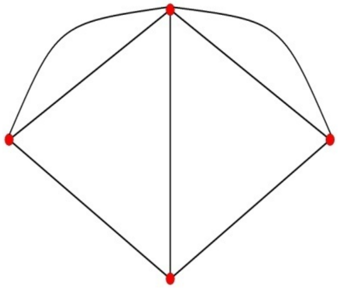


Condition only on beliefs

Voter/Principal $\square_P(\lambda_{tP})$ $\square$ $\square$\{ **K**eep, **R**eplace\}

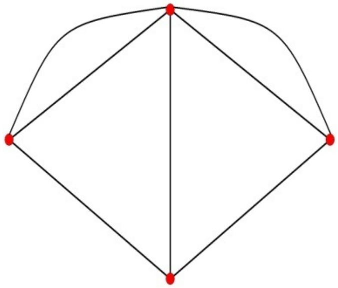
Leader $\square_L(\lambda_{tL}, \lambda_{tP}, S_t)$: \{X,Y\} $\square$ $\square$\{x,y\}

Proposition



There exists a Markov perfect equilibrium in which the leader never takes action y and is no leader is ever replaced (on or off the equilibrium path).

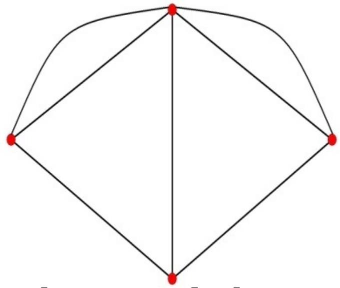
Theorem



In *every* equilibrium in which the principal uses a Markov strategy: $V_{\square P}(\lambda_{0P}) \leq c$.

Thus, if $V_1 > c$ then the value of any equilibrium in which the principal uses a Markov Strategy is worse than simply replacing the leader in every period.

Heuristic proof:



-Because replacement is costly, voter will keep a leader with at least same probability of being competent as replacement

-Thus a newly elected leader who keeps taking action x will never be replaced

-For newly elected leader to take action y, it must be the case that for sure she will never be replaced in the future…

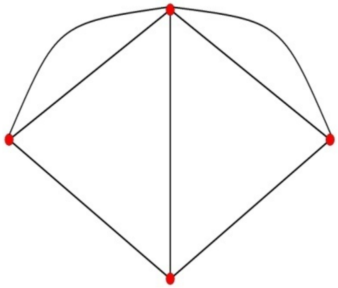
-But with positive probability the leader is incompetent and therefore, if she keeps taking y indefinitely, will fails so often as to make λ_{tP} fall to such a point that she will have to stop taking action y to avoid being replaced

- Continuation value of current leader as of that point is zero, therefore $V_{\square P}(\lambda_{0P}) - c \leq 0 = V_{\square P}(\lambda_{tP})$.

Term Limits

- One period term limit dominates any MPE if $V_1 > c$
- One-period term limit dominates two-period term limit if c low, otherwise two-period term limit dominates one-period term limit
- More generally, longer term limit reduce leader's risk-taking incentives but also reduce per period replacement cost

Proposition



- Pick the largest number of periods T for which better to keep the leader after T-1 periods even if failed in all periods rather than replace.

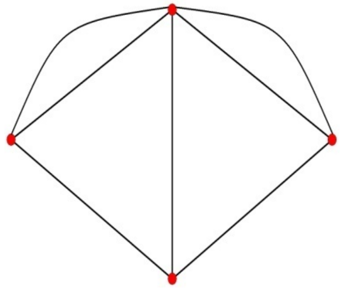
- Then optimal term limit is at least T

Non-Markov Equilibria

- ``Retrospective voting'': can condition upon history in addition to beliefs

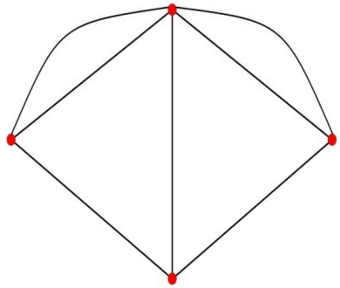
- Is it possible to keep a competent leader forever and to get a competent leader to take efficient actions?

Theorem



Consider any equilibrium □ for which $V_{\square P}(\square, \lambda_{0P}) > c$. There is no posterior for which the leader is `safe’ from being fired in the future, and instead for any posterior level, the leader eventually stops strictly following the signal.

Theorem



Consider any equilibrium $\square$ for which $V_{\square P}(\square, \lambda_{0P}) > c$. For any $(h^{t}_{P}, \lambda_{tP})$ that is reached on the equilibrium path no matter how high(!), there is some continuation $h^{t'}_{P}$ for which $(h^{t'}_{P}, \lambda_{tP})$ is reached with positive probability and such that and the leader is replaced with positive probability conditional upon that history $V_{\square}(h^{t'}_{P}, \lambda_{tP}) \leq V_{\square P}(\square, \lambda_{0P}) - c$.

Underlying idea

. Any equilibrium □ for which $V_{\square P}(\square, \lambda_{0P}) > c$ involves current leader taking y indefinitely (if she decided to switch to x as a finite number of periods, then as of that time she generates continuation value equal to $0< V_{\square P}(\square, \lambda_{0P})- c$ and therefore will be replaced)

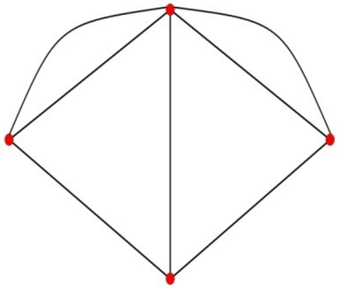
. But if she takes y indefinitely, since she is incompetent with positive probability there is a positive probability that down the road she will be replaced (since by LLN with positive probability failures will occur sufficiently many times as to make principal decide to replace her)

Summary: voting

. ***Voting*** leads to ***highly inefficient payoffs*** due to lack of incentives to act

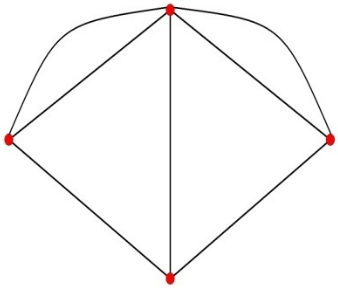
- ***Term limits can restore incentives***, term length limited by learning speed and cost of replacement
- ***Impossible to keep and motivate competent leaders indefinitely***

Tenure, Term Limits



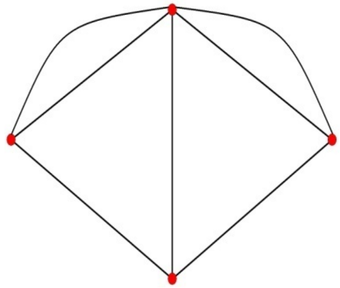
- **Tenure** ensures `proper' risk-taking when:
  - Discretion (not effort) indirectly observed
  - Principal can commit
  - Sufficient patience
  - Replacement costs are not too low
- If principal cannot commit to (K,R) profile ex ante, unlimited repeated assessments can lead to poor risk-taking incentives: instead **term limits** help restore incentives

Extensions

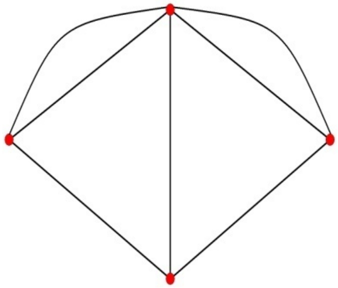


- Promotion rather than just hiring and firing
- Competing leaders
- Competing principals
- New leaders inheriting bad outcomes from previous leaders

Thank you!



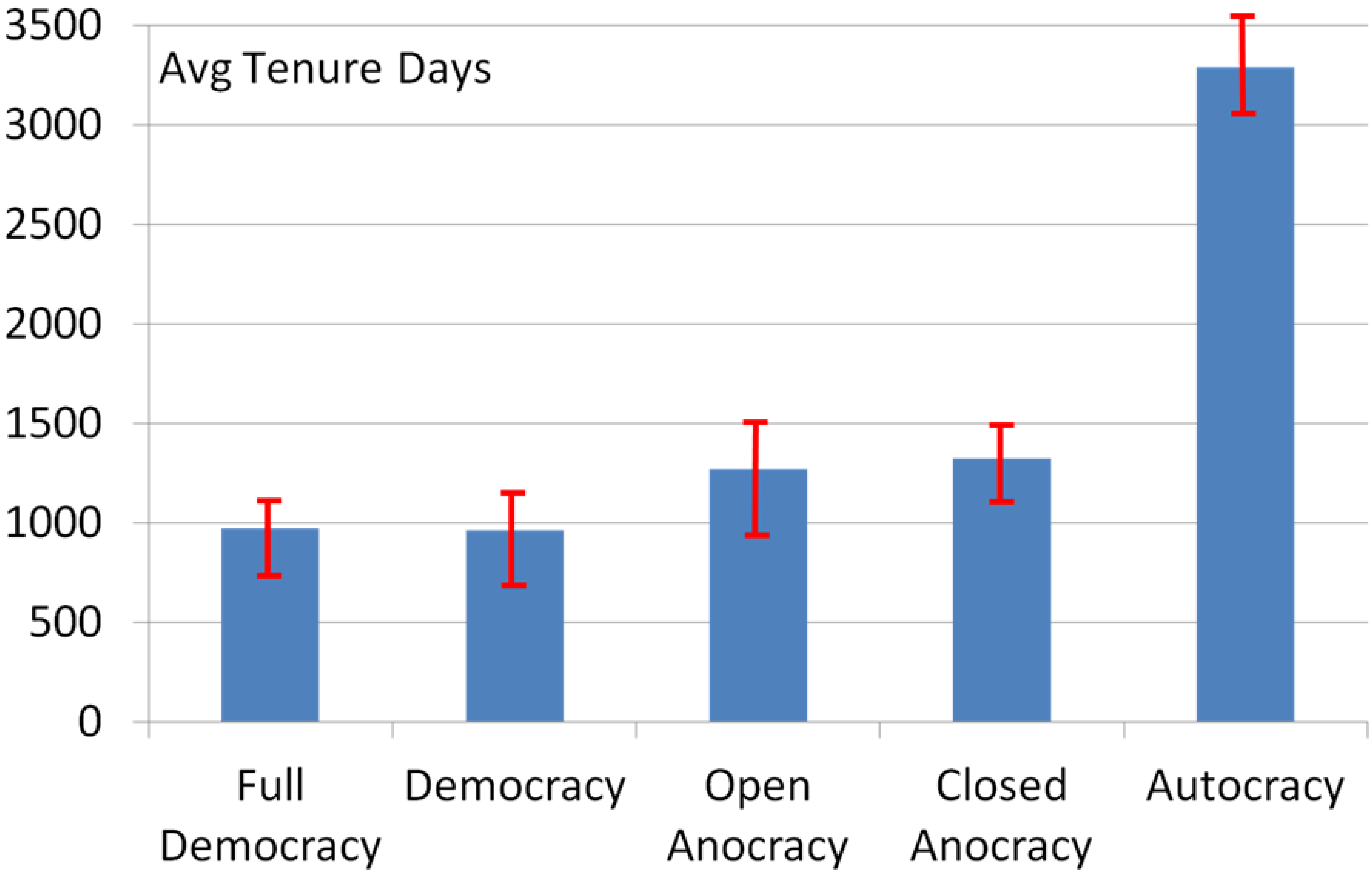
Comparisons



- Democracy: collectively replace leader by vote

- Autocracy: need *very* reliable communication to coordinate

Tenure of Leaders by Political Regime Type (Polity IV): 2789 observations, 1800-2011



Polity IV Current: