Pay For Results, Not Prestige

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Our Many Experts (= Agents)

- Decorator
- Contractor
- Priest
- Doctor
- Therapist
- Teacher
- Researcher
- C.E.O.
- Fund manager
- Reporter
- Politician
- Regulator
- Police
- Lawyer

Three Kinds of Skepticism

Senses – Trust my eyes, ears?

Solution: compare many sources

Authority – Trust king, scholar, priest?

Solution: “science” = stable metrics, shared data, math models

Experts – Are my experts self-serving?

Solution: Pick/pay by records/results

Five Ways To Pick/Pay Experts

Loyalty – Trust folks on your side

Prestige – Go with impressive elites

Process – Follow proper procedure

Records – Go with top track records

Results – Pay only if you get results

Heidhues & Lagerlöf 2003

2 politicians, get binary clue, pick binary policy
1 voter wants politician so policy = binary truth

$$i, r \in E = \{1,2\}, \quad a_i, b_i, e_i \in B = \{0,1\} \quad a = (a_1, a_2)$$

$$\omega = \{b_0(\omega), b_1(\omega), b_2(\omega)\} \in \Omega = B^3, \ \mathrm{Cov_p}[\mathrm{b_0}, \mathrm{b_i}] > 0$$

$$\tilde{\pi}_{i\omega} = \pi_{i\omega}(0) = \Omega, \ \pi_{i\omega}(1) = \{\omega' \in \Omega : b_i(\omega') = b_i(\omega)\}$$

$$u_i(a, r, e_i) = \mathbb{1}[r = i] - \varepsilon\, e_i \quad v_{0\omega}(a, r) = \mathbb{1}[b_0(\omega) = a_r]$$

$$1. \max_{e_i \in B} \mathrm{E}_p[u_i(a, r, e_i)] \quad 3. \max_{r \in E} \mathrm{E}_p[v_{0\omega}(a, r) \mid a]$$

$$2. \max_{a_i \in B} \mathrm{E}_p[u_i(a, r, e_i) \mid \pi_{i\omega}(e_i)]$$ (Use some if mix.)

$$\mathrm{HL}: \text{if } \varepsilon < 0, \text{ then } e_i = 1, \ a_i \text{ neglects } b_i$$

$$\mathrm{Me}: \text{if } \varepsilon > 0, \text{ then } e_i = 0, \ a_i \text{ ignores } b_i$$

Brandenburger & Polak 1996

N managers, get binary clue, pick binary policy
1 trader sets stock to prob. policy = binary truth

$$i \in E = \{1,2,\ldots,N\},\ a_i, b_i, e_i \in B = \{0,1\} \quad a = (a_1, a_2, \ldots, a_N)$$

$$r_i \in R = [0,1],\ \omega = \{b_0, b_1, \ldots, b_N\} \in \Omega = B^{N+1},\ \mathrm{Cov_p}[\mathrm{b_0}, \mathrm{b_i}] > 0$$

$$\tilde{\pi}_{i\omega} = \pi_{i\omega}(0) = \Omega,\ \pi_{i\omega}(1) = \{\omega' \in \Omega : b_i(\omega') = b_i(\omega)\}$$

$$u_i(a, r, e_i) = r_i - \varepsilon\, e_i \quad v_{0\omega}(a, r) = -\sum_{i \in E} (r_i - 1[b_0(\omega) = a_i])^2$$

$$1.\max_{e_i \in B} \mathrm{E}_p[u_i(a, r, e_i) \mid a_i^-] \quad 3.\max_{r \in R^N} \mathrm{E}_p[v_{0\omega}(a, r) \mid a]$$

$$2.\max_{a_i \in B} \mathrm{E}_p[u_i(a, r, e_i) \mid \pi_{i\omega}(e_i), a_i^-], \quad a_i^- = (a_1, a_2, \ldots, a_{i-1})$$

(Use some if mix.)

$$\mathrm{BP}: \text{if } \varepsilon < 0, \text{then } e_i = 1,\ a_i \text{ neglects } b_i$$

$$\mathrm{Me}: \text{if } \varepsilon > 0, \text{then } e_i = 0,\ a_i \text{ ignores } b_i$$

He Who Pays Piper Must Know Tune

Experts learn no more **than clients know** when reward, if

1. Info effort hidden, costly, ordered
2. Experts optimize but not **directly care** re topics, honesty
3. **Coordinate** via (a) see prior expert acts, or
   (b) 2-player 0-sum game

$$i \in E, j \in C, a_{ij} \in A_{ij}, r_{ij} \in R_{ij}, e_{id} \in \Gamma_{id}, \omega \in \Omega, \quad \text{all finite}$$

$$1.\ \max_{(e_{id})_{d \in D}} \mathrm{E}_{p_i}[u_i(a,r,e_i) \mid \tilde{\pi}_{i\omega}, a_i^-] \quad \pi_{i\omega}(e_i) = \bigcap_{d \in D} \pi_{id\omega}(e_{id})$$

$$2.\ \max_{(a_{ij})_{j \in C}} \mathrm{E}_{p_i}[u_i(a,r,e_i) \mid \pi_{i\omega}(e_i), a_i^-] \quad a_i^- = (a_{kj})_{k \in E: k < i}$$

$$3.\ \mathrm{pick}_{(r_{ij})_{i \in E}} \mathrm{E}_{p_j}[v_{j\omega}(a,r) \mid \pi_{j\omega}, F(a, r_j^-)] \quad r_j^- = (r_{ik})_{k \in C: k < j}$$

$$\text{If A) exists focal } \hat{\pi}_\omega \subseteq \pi_{j\omega} \text{ so } \pi_{id\omega}(e_{id}) =, \subseteq, \text{or} \supseteq \hat{\pi}_{d\omega}.$$

$$\text{B) if } \pi_{i\omega}(e_i') \subset \pi_{i\omega}(e_i) = \hat{\pi}_\omega, \text{ then } u(a,r,e_i') < u(a,r,e_i).$$

$$\text{Then } \pi_{i\omega}(e_i) \supseteq \hat{\pi}_\omega$$

Obstacles To Paying For Results

Individuals:

- Wait to get paid
- Pay more than have
- Noise makes pay risk
- Evaluation stress

Organizations:

- Market power
- Bad act bundles
- Unmeasured results

How to Measure Anything, Hubbard 2010

Buy Health, Not Health Care

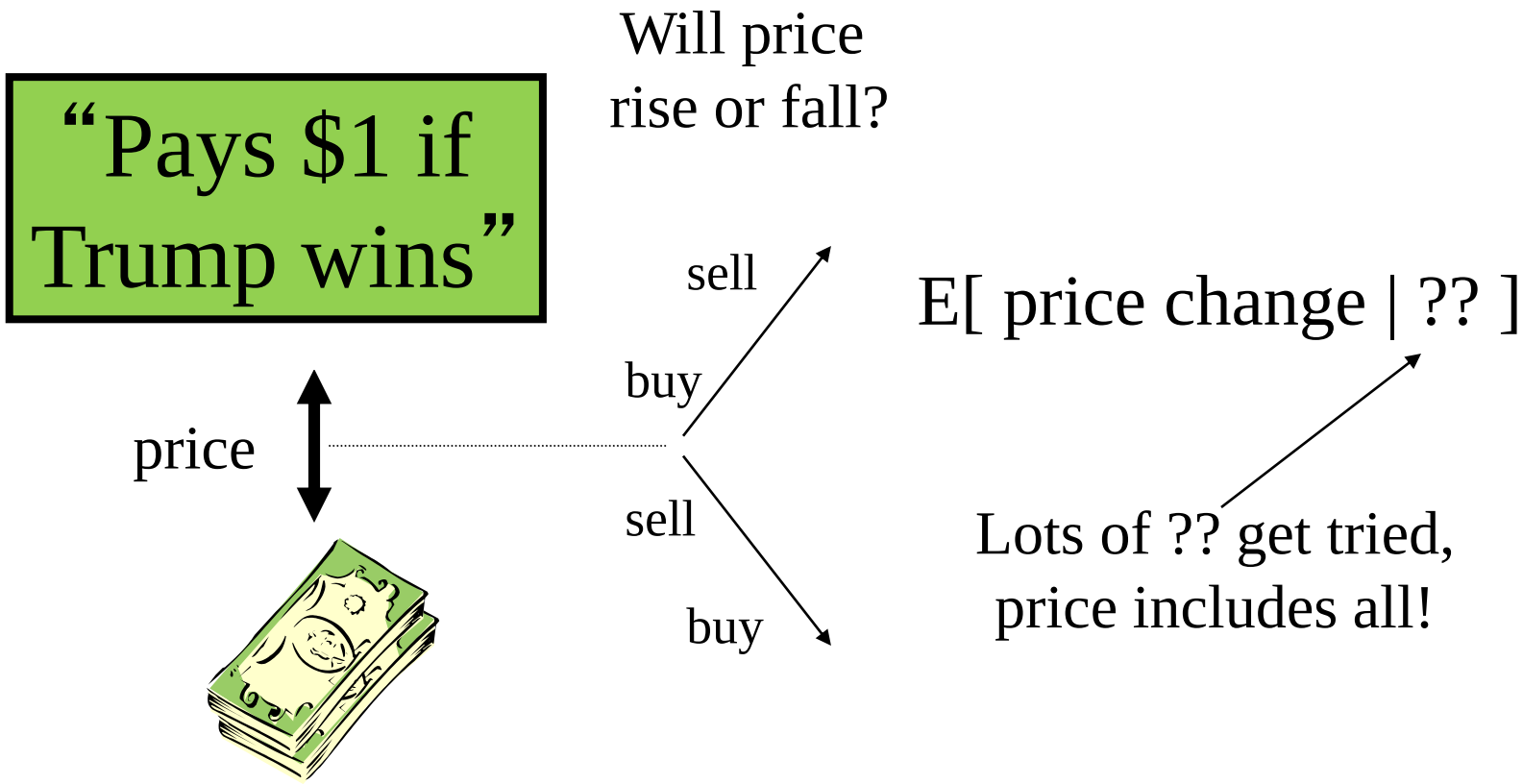
- Buy life, pain, disable, & health insure from LMO
- They pick/pay medicine
  - *Internalize tradeoffs!*
- Advise re other acts
- Pick min premium LMO
- Set life, etc. insure to own value of life, etc.
- Extra insure payout to Anti-LMO, who pays part of LMO premium
- Anti-LMO can't act:
  - Few employees
  - Transparent
  - Sits far away

Who Vouches For You?

(*Not* change how pick what is crime, fines, court rulings.)

1. Require all get ***VOUCHER*** to cover *all* legal liability
   - voucher = shows can pay (& reinsured), on hook until replace
2. All crimes punished officially via ***FINES***
   - Voucher pays fine F re client act, except crime of no voucher
   - Fine F pays for bounty B, victim help C, govt. revenue R
   - Voucher-client contract specifies: *premium, punish, co-liable groups, limits on movement, monitor/privacy*
   - Fines F can vary with freedom limits via 1/p(catch) **
3. All enforcement via ***BOUNTY*** hunters
   - First to convince court paid, T.B.D. rights re evidence collected
   - Blue-wall-of-silence only if *all* hunters forgo bounties

Buy Low, Sell High



Advantages

Incentives
Self-Selection
Correct Biases

- Numerically precise
- Consistent across many issues
- Frequently updated
- Hard to manipulate
- Need not say who how expert when
  - Issue is *not* experts vs. amateurs
- At least as accurate as alternatives
- Easy to subsidize so $ *only* to info adders

(Tournaments: org picks Qs, players, scoring fn., consensus fn.
Similar gains, but for them must trust org who manages)

Estimates from Prices

$1 if A ⟷ p(A) $1

$1 if A&B ⟷ p(A&B) $1

$1 if A&B ⟷ ? $1 if A

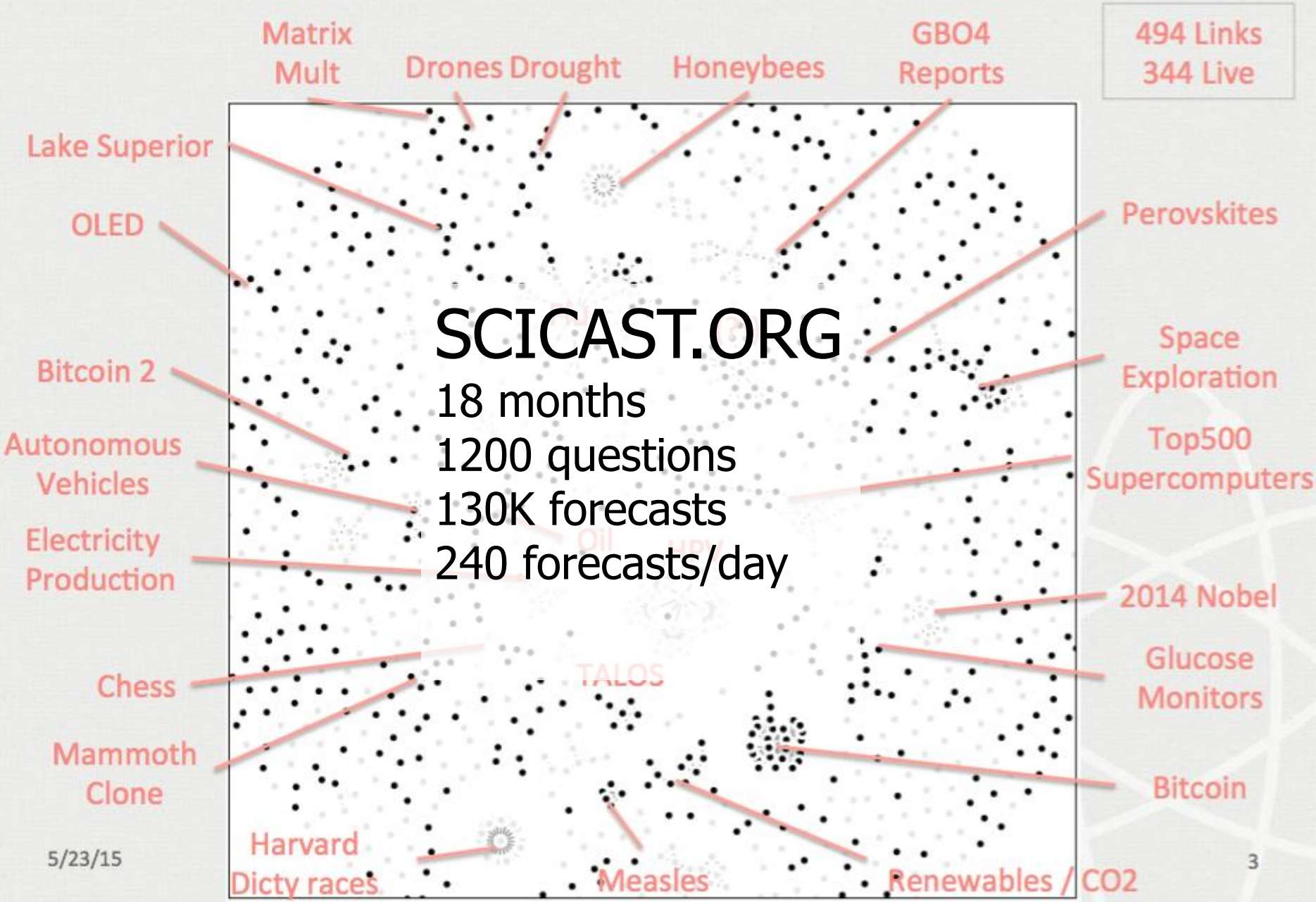
$$p(A\&B) \qquad \frac{p(A\&B)}{p(A)} \qquad p(A)$$

$$\cancel{p(B|A)}$$

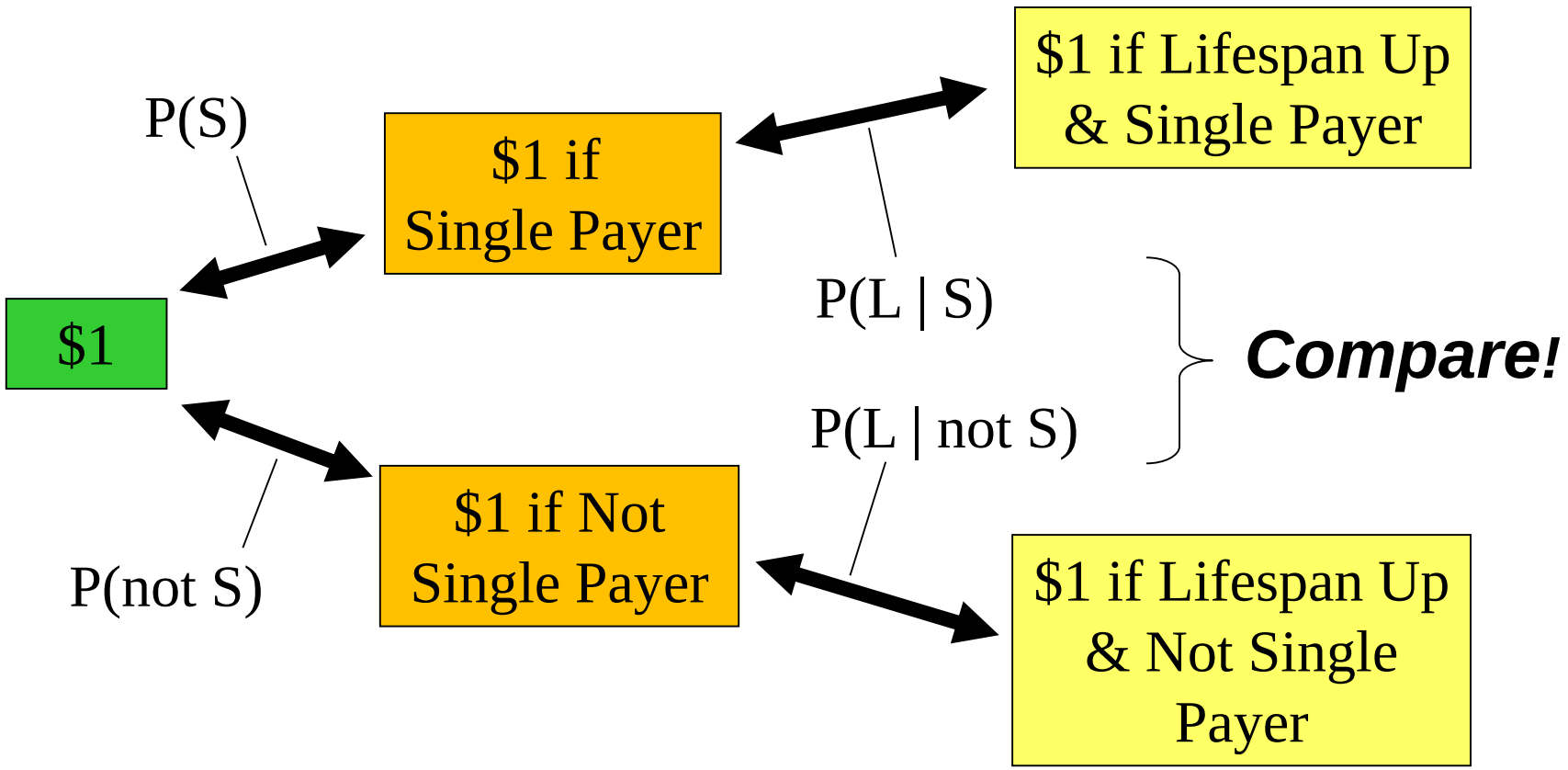
Estimates from Prices

$1 if A	⟷	p(A)	$1
$1 if A&B	⟷	p(A&B)	$1
$1 if A&B	⟷	p(B|A)	$1 if A
$ x	⟷	E[x]	$1
$ x if A	⟷	E[x|A]*p(A)	$1
$ x if A	⟷	E[x|A]	$1 if A

COMBINATORIAL



Single Payer Decision Markets



If I Had A Million

- Two markets for each Fortune 500 firm:
  E[Stock price | CEO leave this quarter]
  E[Stock price | CEO stay this quarter]
- Lots press, CEOs study, try to influence
  - Let them pay to delist firm?
- Track ROI of firms follow advice vs. not
  - Few years to see significant difference
  - Shame/sue boards to follow advice

2016 US President Race

Candidate	Nominate?	Win?	Win if Nom.?
Clinton	78%	46%	58%
Warren	4.8%	2.9%	62%
Biden	4.8%	2.9%	62%
Omalley	3.8%	2.0%	51%
Rubio	22%	11%	50%
Paul	9.1%	3.8%	42%
Bush	31%	18%	59%
Walker	20%	7.7%	39%

oddschecker.com in Feb 2015

Block size changes

https://blocksizedebate.com

Metric	No change	Block size increase (82.4% likelihood)
Price	$280.33	$555.57
Network hash rate	3,255.17 PH/s	5,032.64 PH/s
Daily transaction volume	168,438.22 tx/day	193,773.08 tx/day
Number of nodes	5,222.57 nodes	1,265.37 nodes

Replace-by-fee patch

Metric	No change	Replace-by-fee patch committed (13.6% likelihood)
Price	$533.00	$342.54
Network hash rate	4,969.68 PH/s	3,132.09 PH/s
Daily transaction volume	192,603.80 tx/day	168,406.73 tx/day
Number of nodes	1,720.41 nodes	3,500.76 nodes

Academia

Today:

- Main function: credential people as *impressive*
  - status via association to: patrons, students, media.
- Each discipline self-evaluates, defends turf
- Consensus, intellectual progress are side effects

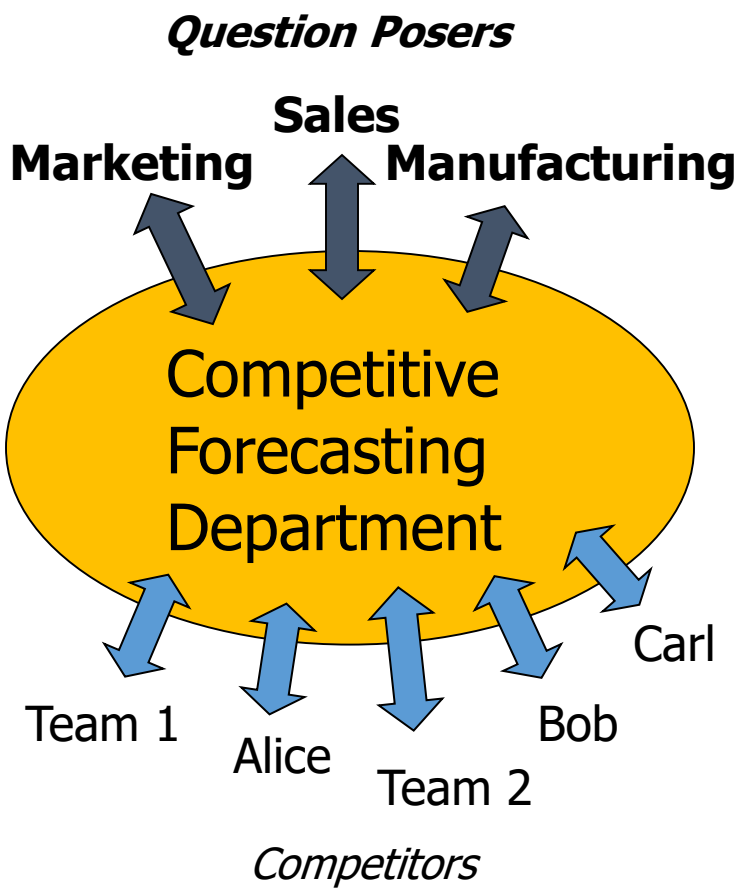
Proposal:

- Patrons fund markets on *Questions That Matter™*
  - Settle: directly measurable or long term consensus
- Research labs: hire people, invest, win via trade
- *Can Also:* study replicate, pubs. if hire, cites if publish, GPA if admit

Info Accounting Proposal – Buy Side

Charge Question Posers By

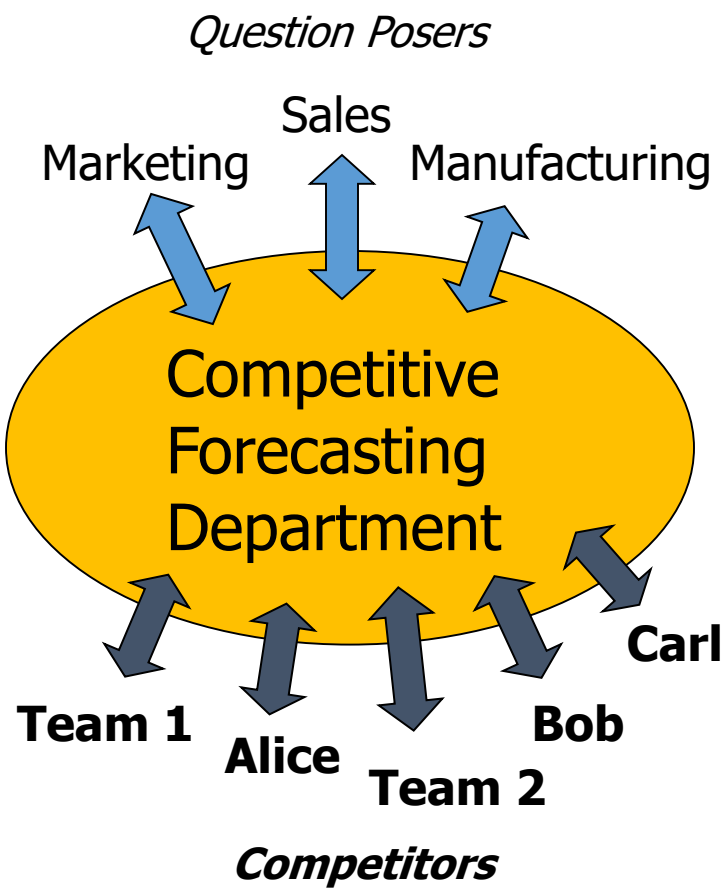
- Estimate $ value of info
  - E.g., demand variance
- Match $ subsidy level
  - E.g., liquidity **b** in LMSR
- Can vary by price, time
- Charge subsidy used
  - Plus admin. overhead



Info Accounting Proposal – Sell Side

Credit Competitors By

- Use a new "color of money"
- Track actual subsidy gained
- *If* stats show consistent gain,
- *Then* credited as value to org.
  - Minus time taken to compete
- Separate accounts to track
  - Bias correction procedures
  - Official stat use, trade first?
- Score budget gatekeepers too



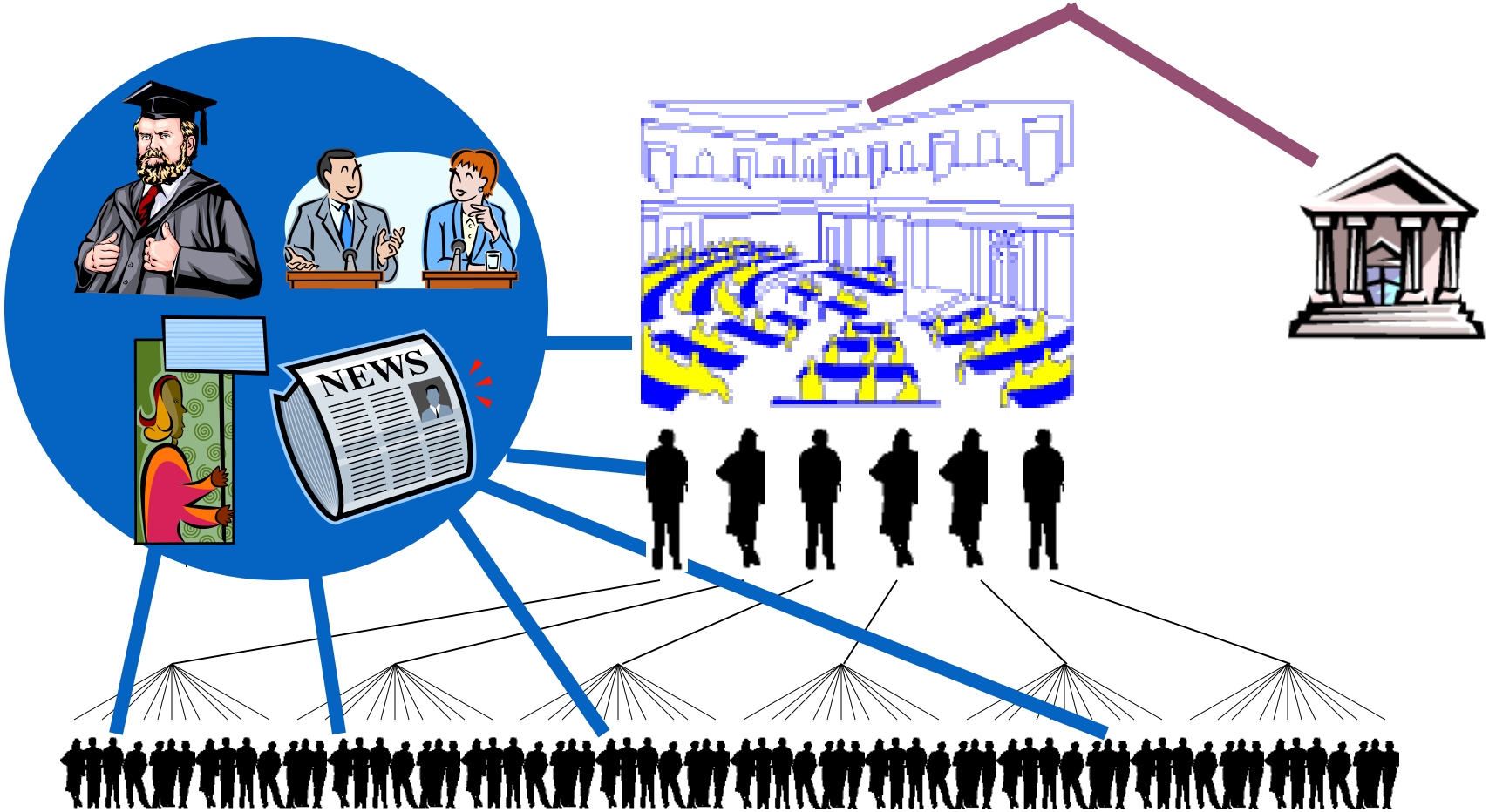
Three Premises and a Conclusion

1. It is not too hard to tell rich happy nations from poor miserable ones long after the fact.
2. Governments largely fail by not aggregating available information.
3. Speculative markets are our best known institution for aggregating information.

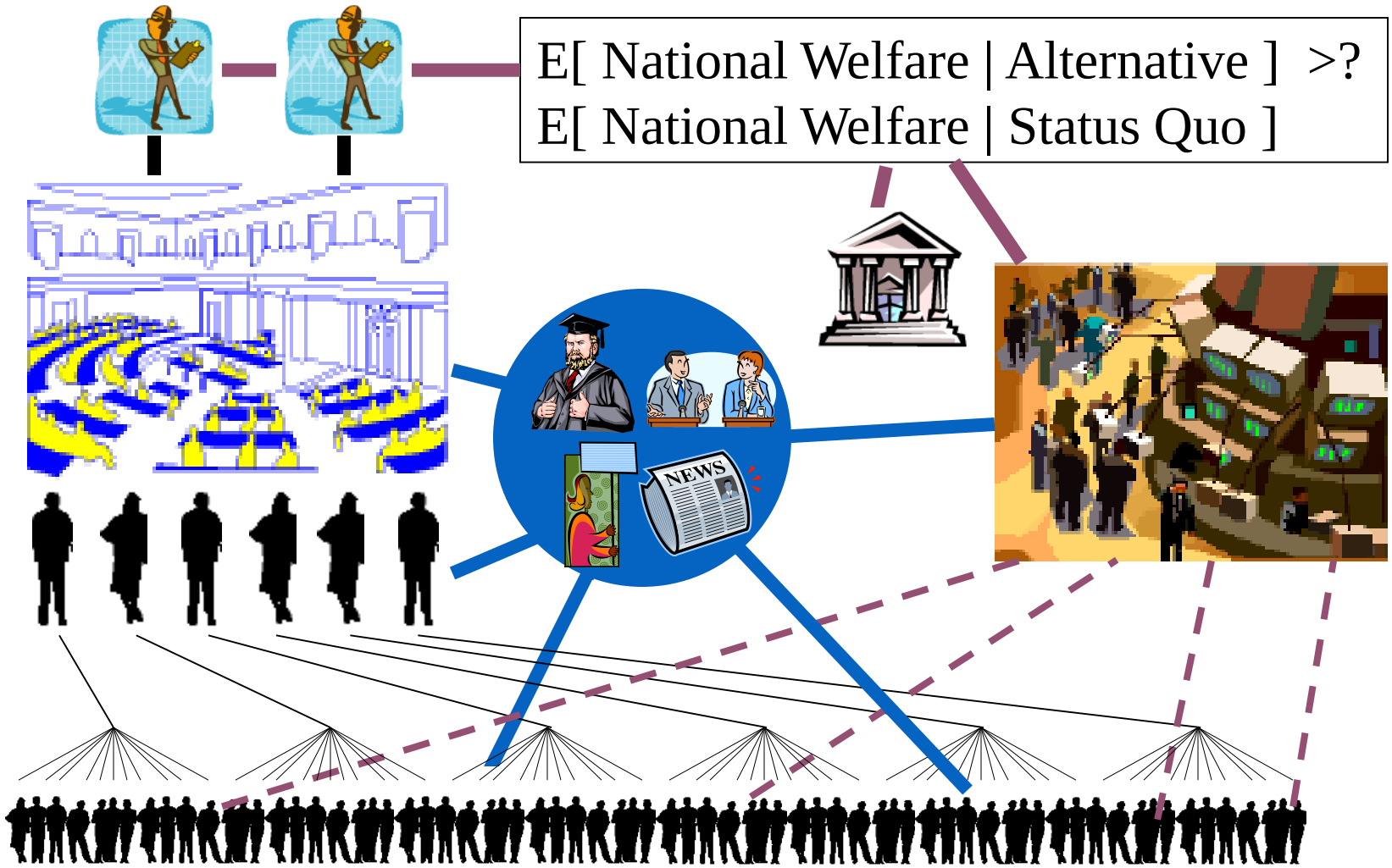
∴ Try to vote on values, but bet on beliefs.

Our Democracy

Passed Bills => Laws



Vote On Values *But* Bet On Beliefs



Futarchy's Main Rule

If valid market estimates National Welfare higher given proposed policy, it becomes law.

- Unless market on future-defined NW vetoes
- Start with existing policies, fee/reward for proposals
- Each proposal says:
  - short pre-set time window to approve
  - how handle conflicts with other laws
- High standards at base, recurse to relax standards
- Treaties could agree to include other nation's NW.

Robin Hanson (2013) "Shall We Vote on Values, But Bet on Beliefs?" *Journal of Political Philosophy*, 21(2):151-178, June.

Concerns

Intuitive, Common

- Rich get more "votes"
- Buy policy via market
- Market bubbles
- More lies, secrecy
- Do harm to win bets
- Forgo popular illusions

Regarding Natl. Welfare

- Policy in NW defn.
- Max NW meas. errors
- Slow catch NW bugs
- Corrupt NW measure
  - More when more care

More Concerns

Same As Democracy

- Guarantee rights
- Time-inconsistency
- Induce policy cycling
- Expressive voting
- Too many policies
- Military needs secrecy
- Losers fight transition

Economics, Technical

- Markets too thin
- Most policy too small
- When "clear" diff.
- What if destroy Earth
- Infinity never comes
- Risk premia distortion
- Decision selection bias