Prediction Markets
Robert Sloan, March 2010

Graph from Iowa Electronic Markets
http://iemweb.biz.uiowa.edu/graphs/graph_PRESo8_VS.cfm
Markets of assets of unknown desirability

- When the Shah of Persia was invited to attend the Derby, he replied, “It is already known to me that one horse will run faster than another.”

- Unknown desirability can be **exogenous**: desirability is independent of how individuals make decisions. E.g., horserace

- Or **endogenous**: desirability is a function of the decisions that people make about it.
Exogenous, endogenous

- Exogenous: Predicting future events where our predictions don’t have an effect on the event.
  - Sports gambling, stock picking (for me)

- Exogenous: choices affect worth
  - Symmetric Information: Network effects
    - Fax machines, Facebook vs. MySpace vs. Buzz
  - Asymmetric information
    - Insurance (insured knows more than insurer)
    - Moral Hazard, Adverse Selection, and Lemons Markets are in this case
Prediction markets

- Prediction markets or information (futures) markets or event futures typically have trading on securities priced so that they are worth, e.g., $1.00 if event X happens by specified date, and worth 0 if event X did not happen by that date.
Example

“The Republicans to control the Senate after the 2012 Congressional Elections:”

This contract will settle (expire) at 100 ($10.00) if the party named in the contract controls the United States Senate after the 2012 Congressional elections; the contract will settle (expire) at 0 ($0.00) if the party named in the contract DOES NOT.

A party will be considered in control of the Senate if they:

1. Hold 51 (or more) Senate seats

2. Hold 50 Senate seats and has the Senate vote of the Vice President of the United States in his or her role as President of the Senate.

For expiry purposes any Senate seat held by an Independent who caucuses or votes with the Democrats will be considered Independent and NOT a Democratic seat. The same rule applies to any Independent who caucuses or votes with the Republicans.
Why prediction markets?

- Markets aggregate diverse opinions into a price:
  
  Fundamentally, in a system in which the knowledge of the relevant facts is dispersed among many people, prices can act to coordinate the separate actions of different people. . . .” (Hayek, 1945)

- Sometimes (often???) the aggregate opinion of a large, motivated (by profit) crowd is better than any other source of information.

- For prediction market, or even two individuals betting on a 2-horse race, if there is a trade/bet, then the price separates the beliefs of the two people making the trade/bet
The economic analysis

- Prediction market will come down to the well-studied case of the ideal two-horse horse race.
- (Assuming either that people are risk neutral or that their utility for wealth \( w \) is proportional to \( \ln w \)), the optimal strategy is to bet your beliefs.
- And the market will converge to the probability/odds that is the average (weighted by wealth) of all participants’ beliefs.
- Prediction markets’ securities give us concrete form of the state prices of economic theory.
Major prediction markets

- Iowa Electronic Markets (limited to $500)
- Intrade
- For sports: TradeSports, BetFair (UK only)
What’s the point?

- There are lots of things in the future where we would like to have good predictions about.
- Large list of companies have tried these, to have, e.g., employees predict what projects will be on time or succeed, or what requirements clients will have in a year’s time.
  - Google, HP, Abott Labs, Best Buy, Chrysler, Corning, Electronic Arts, Eli Lilly, Frito Lay, General Electric, Intel, Microsoft, Motorola, Nokia, Pfizer, Qualcomm, Siemens.
- As did Admiral Poindexter on behalf of DARPA early in Bush (W) administration. . . .
And we hope

- information about computer vulnerabilities
- In fact, the two outfits known for paying for vulnerability information, are not running prediction markets:
  - iDefense
  - Tipping Point (division of 3Com since 2005)
Why do people participate?

- To make money
- Entertainment
- Overconfidence in their ability to predict
- NOT (yet?) to hedge risk, because these markets are not large enough
Possible problems

• Only as good as the (best?) traders; people are very poor at distinguishing among low and very low probabilities.

• Need a liquid market; experts who all agree won’t trade; need some fish, or at least diverse and independent opinions.

• Markets on contracts with wide interest but only a few insiders would have information have not done well.
  • Intrade’s contract on next SCOTUS Justice retirement has very low volume. (Most recent trade: 1 share of Justice Stevens changed hands on March 4.)
Wolfers & Zitzewitz
2006

- 5 Questions
  1. How to attract uninformed traders?
  2. Trade off between event of interest and writing it into an enforceable contract
  3. How to limit manipulation
  4. Are markets well calibrated on small probabilities?
  5. How to separate causation from correlation?
Right now

- Intrade’s “Obamacare Healthcare will be signed into law by June 30, 2010” contract was trading in the 30’s since Scott Brown’s MA U.S. Senate victory.

- Moved sharply on Thursday, March 4, has been trading between high 40’s and low 60’s ever since.

- Most recent trade” 62.5 at 11:39 a.m. Central Time Tuesday, March 9.