Prediction Markets

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Markets Reveal Information

- Markets can aggregate information about buyers (valuations) and sellers (costs)
  - High valuation (> market price) buyers buy
  - Low cost (< market price) sellers sell

- Outcome of Trade is "Efficient"
  - Those who need it most would receive it

Markets Reveal Information

- This is also true for items with uncertainty
  - Stocks, antiques, iPods on eBay, permits, etc.

- The Efficient Market Hypothesis
  - All information (about a stock/item) is already contained in the market price
  - Revealing information does *not* change prices

Markets Reveal Information

- Why? Because of "Non-Arbitrage":
  - If I really think the stock price is too low based on my information, I should buy like crazy
  - If I really think the stock price is too high, I should sell (or "short") like crazy
- But these "crazy" trading will affect prices
  - Buying like crazy would drive the price up
  - Selling like crazy would drive the price down

Markets Reveal Information

- The price change reveals your private information
- In equilibrium, the final price reveals everyone's private information

- As if the market knows all information

Prediction Markets

- Markets can aggregate information about buyers (valuations) and sellers (costs)
  - Efficient Market Hypothesis
- Can markets gather other information?
  - EX: Tradable permit markets gather private information about pollution reduction costs
- Yes, by creating markets of "new items"
  - What are these items?
- Futures about an event!

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Prediction Markets

- Winner-take-all: (~看好度)
  - H stock: Pay $100 if Frank Hsieh wins the Taiwan presidential election, $0 otherwise.
  - M stock: Pay $100 if Ying-Jeou Ma wins the Taiwan presidential election, $0 otherwise.
- Vote share markets: (~支持度)
  - HVS: Pay $y if Frank Hsieh earns y% of the votes in the Taiwan presidential election
  - MVS: Pay $z if Ying-Jeou Ma earns z% of the votes in the Taiwan presidential election

What Do These Predict?

- Winner-take-all: (Probability of winning)
  - If H stock has price $10, but you believe the chances of Hsieh winning is 70%, you should buy a lot of H stock (since they are a bargain)
- Vote share:
  - If MVS has a price of $40, but you believe Ma would win 60% of the votes, you should buy a lot of MVS (since they are a bargain)

Better Than the Polls?

- Polls do not sample the population evenly
  - Some people are not reachable by phone
  - Some people decline to answer
- Polls weight all samples equally
  - Some know more information than others
- "Good" polls try to correct for these biases
  - Taiwan polls don't, and are way off
- But these corrections are ad hoc

Better Than the Polls?

- Prediction markets do not sample the population either, but
- Prediction markets encourage those who have more information to participate
  - You will earn more if you are "right" and buy more M stocks and HVS
- Prices aggregate information, and put more weight on "better information"

Prediction Markets in the World

- Iowa Electronic Market: (academic, real money with a limit of US$500)
- http://www.biz.uiowa.edu/iem/
- TradeSports: (in Ireland; real money)
- http://www.tradesports.com/
- Hollywood Stock Exchange:
  - (movie box office; play money)
- http://www.hsx.com/

Iowa Electronic Market

TradeSports

Hollywood Stock Exchange

Prediction Markets in Taiwan

- Taiwan Political Exchange:
- http://socioecono.phys.sinica.edu.tw/
- NCCU Prediction Market Center:
- http://nccupm.wordpress.com/
- 未來事件交易所 (Swarchy)
- http://nccu.swarchy.org/
- Note: Unfortunately, all use play money.

Are Prediction Markets Accurate?

– Source: NCCU Prediction Market Research Center

Iowa Electronic Market (real money)


Iowa Electronic Market (real money)
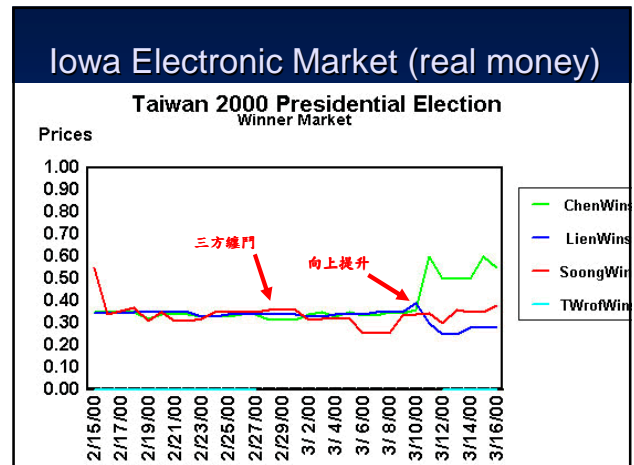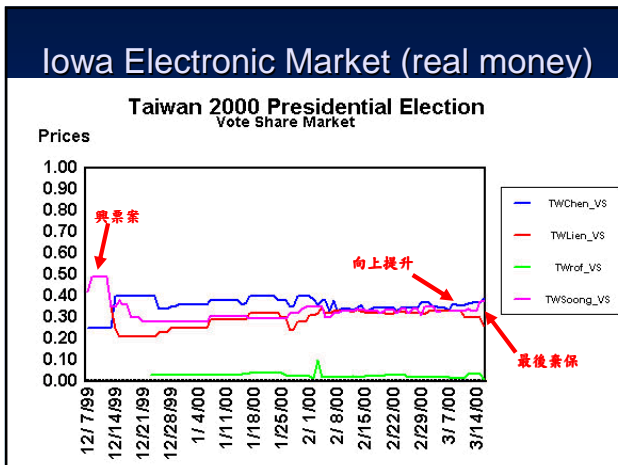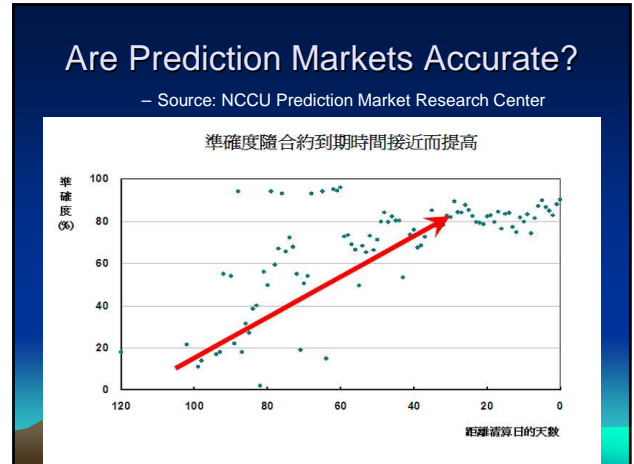
Are These Prediction Accurate?

- Possible…
- What about "319"?
- Unfortunately, Iowa Electronic Market did not host Taiwan's 2004 election

- But, Taiwan Political Exchange did!
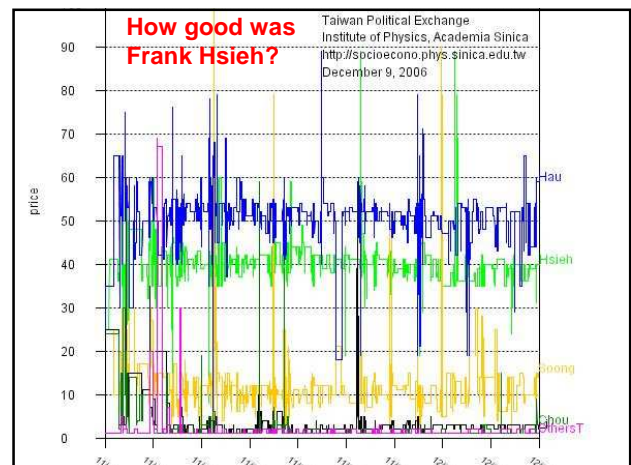 – Reminder: This is a play money market…
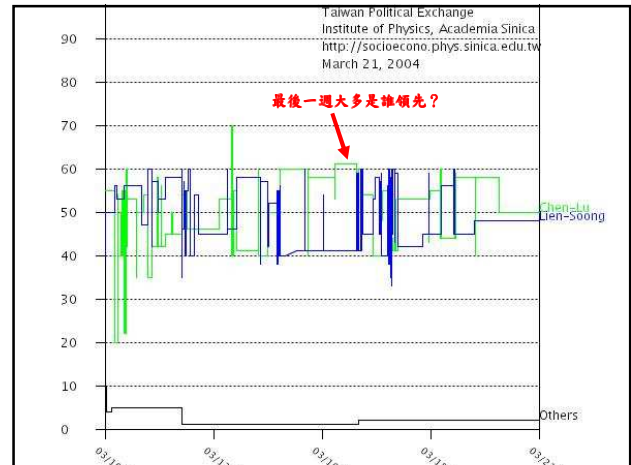
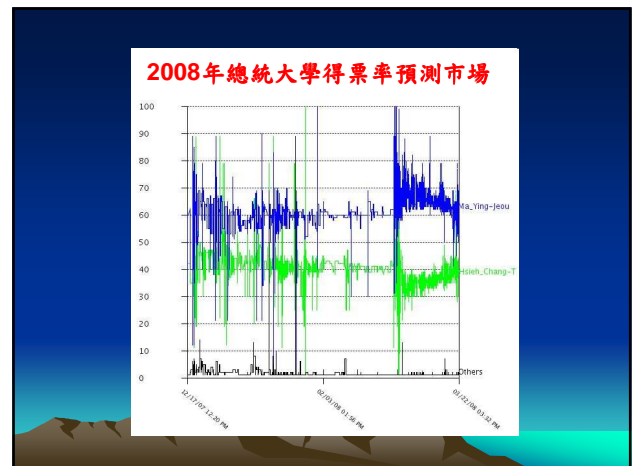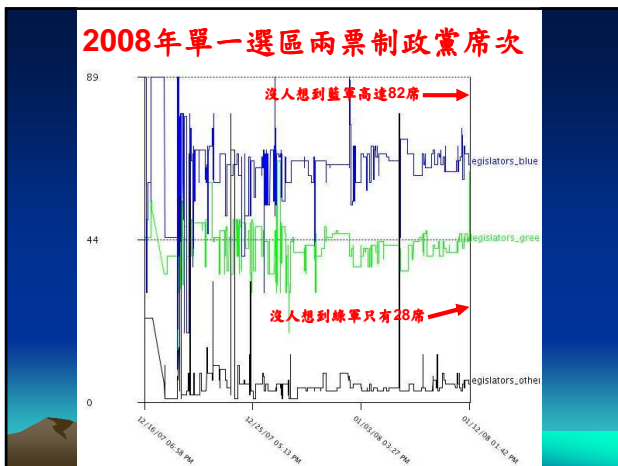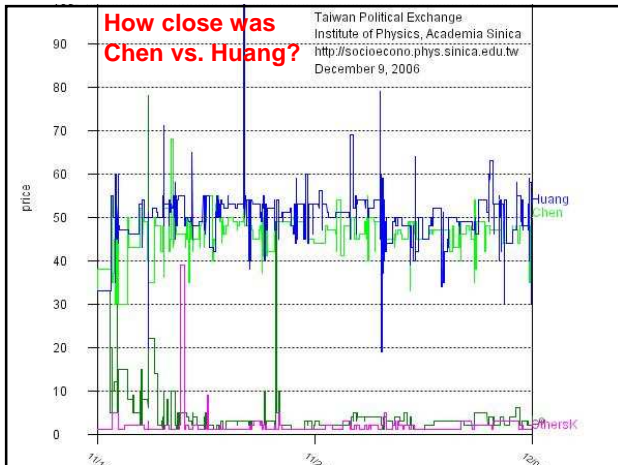## What Does the Market Tell Us?

- Chen-Lu were leading even BEFORE 319.
- 319 boosted turn-out from both camps
- Overall effect on winning is indetermined
  – Markets show Chen-Lu would win anyway
- NOTE: This is a play market
  – What are possible problems with play money?
- How about other events? 2004 Legislation:
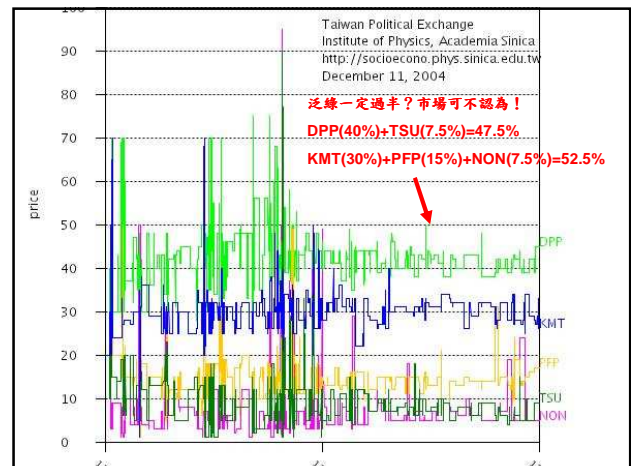
What Does the Market Tell Us?

- "Pan-Green will pass a Half (泛綠過半)" was just a myth
- DPP + TSU was never significantly > 50%

- More recently, you can watch Taipei and Kaohsiung's mayoral elections in 2006:

How close was Chen vs. Huang?

News Events and Prices

2006年高雄市長選舉得票率預測價格走勢圖

2008年單一選區兩票制政黨席次

2008年總統大學得票率預測市場

Are Prediction Markets Accurate?

- Markets only "aggregate" information of all participating traders
  - Participation barriers matters
  - Credit constraints
  - Short-selling restrictions
- Reaction speed also affects the extent prices reflect information
  - Liquidity matters

Conclusion

- Markets aggregate information
- Prediction markets utilize this to make predictions about future events
- Open Questions:
- Do play money or real money matter?
- Can one manipulate prediction markets?
- How is information aggregation done?