

# Prediction Markets

Joseph Tao-yi Wang

## 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!**

## 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/>



The screenshot shows the Iowa Electronic Market (IEM) website. At the top, it says "Iowa Electronic Market" and "THE UNIVERSITY OF IOWA HENRY B. TIPPIE COLLEGE OF BUSINESS". Below this is a navigation bar with "Login and Trade", "Open an Account", and "Current Market Quotes". The date "November 27, 2007" is displayed. The main content area is divided into several sections: "About the IEM", "FAQ", "Current Markets", "Instructor Resources", "Account Maintenance", "Trader's Manual", "Data Archive/Research", and "Announcements". The "Announcements" section contains a notice about trading opening on March 2, 2007, for the 2008 U.S. Political Conventions. A list of market types is provided, including Political Markets, Economic Indicator Markets, Classroom Markets, Related Markets, and Influenza Prediction.

## TradeSports

Tradesports.com

The World's Leading Sports Trading Exchange  
Profit From Your Passion

Ready To Get Into The Game? [View our Demo](#)  
[Free \\$5,000 Practice Account](#)

Trading Categories

Host Active Today

Sports Markets

- All Markets
- Baseball
- Basketball - NBA
- Basketball - NCAA
- Boxing
- Football - NFL
- Football - NCAA
- Hockey
- Soccer - European
- Soccer - International
- Soccer - UK

Non-Sports Markets

- Current Events
- Entertainment
- Financial
- Legal
- Politics
- Weather

**NFL Football**

- AFC Champion 2007/08
- NFC Champion 2007/08
- Super Bowl XLII Winner
- AFC North Winner 2007

**NBA Basketball**

- NBA Championship outright Winner 2007/08
- Western Conference Winner 2006/2007
- Eastern Conference Winner 2006/2007
- NBA Regular Season Wins 2007/08

**NCAA Football**

## Hollywood Stock Exchange

HOLLYWOOD STOCK EXCHANGE® home movies H\$hop login join

THE ENTERTAINMENT GAMING DESTINATION!

**MOVIE STOCKS**  
The Other Releasn Girl / Ricki Lake

**STAR BONDS**  
Timothy Olyphant / Ricki Lake

sign-up [learn more]

1 JOIN For Free & Earn 2 million Hollywood Dollars

2 BUY, SELL OR HOLD MovieStocks & StarBonds with your H\$

3 WIN Build a portfolio and get cool stuff

**WANT TO BE A PLAYER? TELL ME MORE!**

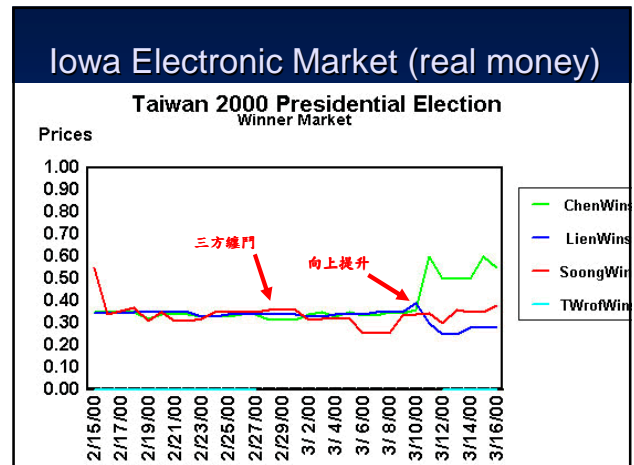
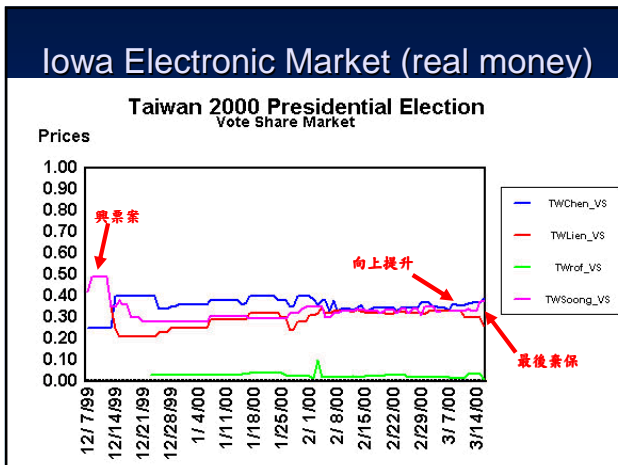
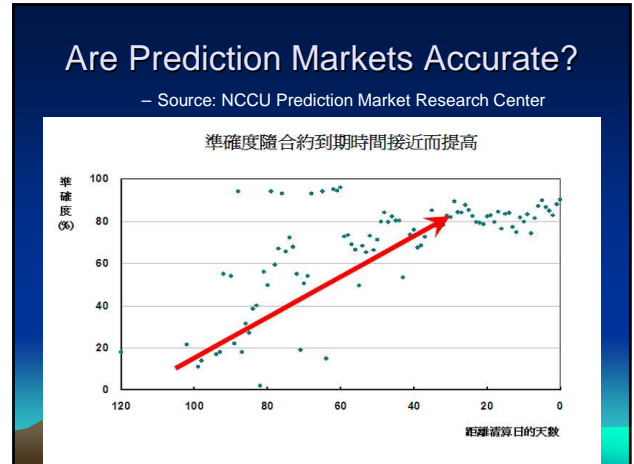
**MOVIE IPO OF THE DAY**  
Mandrake [MADRK] H\$20.00  
Jonathan Rhys-Meyers will play Mandrake the Magician

**RESEARCH**  
The Box Score: The weekend box office was Enchanted with the second best The Princess Diaries

**FEATURES**  
TVStocks Now you can trade all the new network TV series for free!

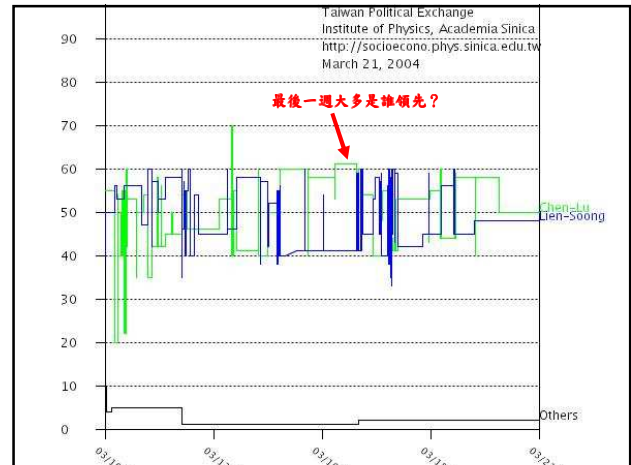
## Prediction Markets in Taiwan

- 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.



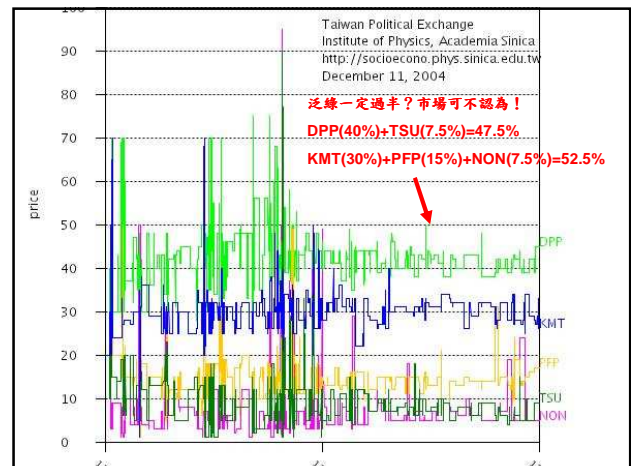
## Are These Prediction Accurate?

- 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...



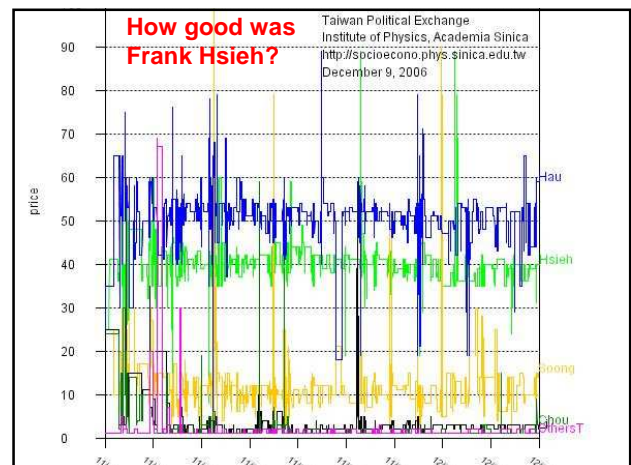
## What Does the Market Tell Us?

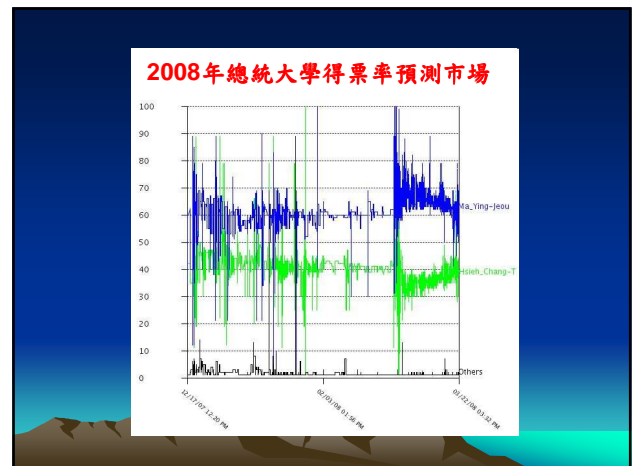
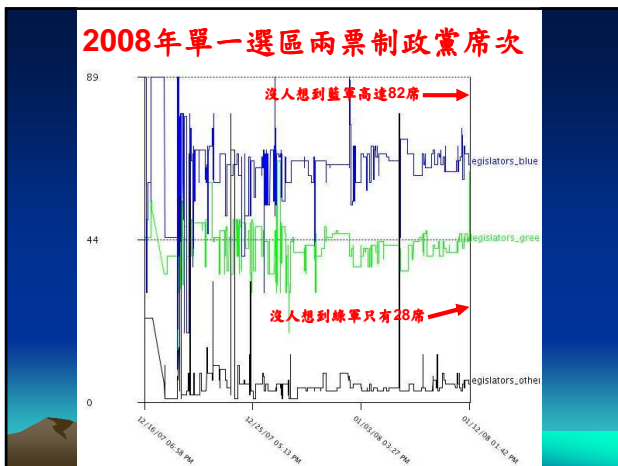
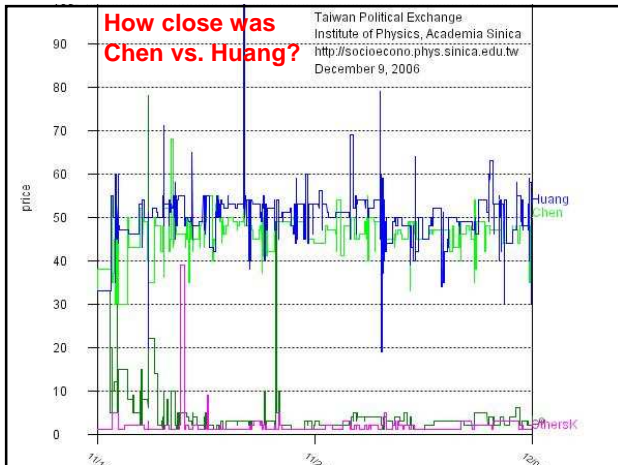
- Chen-Lu were leading even BEFORE 319.
- 319 boosted turn-out from both camps
- Overall effect on winning is indetermined
  - Markets show Chen-Lu would win anyway
- NOTE: This is a play market
  - What are possible problems with play money?
- How about other events? 2004 Legislation:



## 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:





### 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?