Online brokers

- Killer App of the Internet
  - 1996: 1.5 million online accounts
  - 1998: 5.3 million
  - 2002: 14.4 million (Forester)
  - 25% of all retail trades

Customer behavior

- E-Trade: 25 trades per year
- Full-service broker: 1-2 trades per year
- Discount broker: 4-6 trades per year

Next wave: cybermarkets

- OptiMark
  - trading NYSE stocks on Pacific Stock Exchange; NASDAQ next
- MATIF - French futures market
  - offered both electronic and floor trading
  - electronic won after 2 weeks
  - Seats
    - NYSE down 32%, Chicago down 52%, Merc down 64%

What do we know about online trading?

- Research on Internet trading goes back at least 10 years
- Interesting examples
  - Iowa Electronic Markets (1988)
  - Santa Fe Double Auction (1989)
- current exotic markets

Iowa Electronic Markets

- Opened for trade June 1, 1988
- Traded securities for 1988 US Presidential candidates
- terminal value of Bush security = fraction of popular vote Bush received
- prior to termination: good forecast
Outcome of IEM

- Vote forecast for Bush: 53.2% (exact)
- Vote forecast for Dukakis: 45.2% (off by .2%)
- Comparison to polls
  - much less volatile
  - polls exhibit classic biases
  - market did not exhibit biases

Why was IEM so accurate?

- More rational participants?
  - No, they showed same biases
- Market reflects weighted average
  - marginal traders
    - higher investment
    - higher return
    - more frequent trades
    - more “rational”

Santa Fe Double Auction

- Program trading in bid/ask market
- Tournament play
- $10,000 prize offered by IBM
- 30 programs
  - 15 economists, 9 computer scientists, 3 mathematicians, etc.

Outcome of Santa Fe

- Winner: Todd Kaplan, economics grad student
- Why he won....
- What his program did
  - “non-adaptive, non-predictive, non-stochastic, and non-optimizing”

Kaplan’s algorithm

- “Let others do negotiating. When bid and ask get within 10%, jump in and steal the trade”
- Clearly dominated, even when other programs optimized against it
- “Evolutionary tournament”
  - after 28,000 plays had total domination
  - then market crashed!

Current exotic markets

- Idea Futures Market
  - “DJI below 7,000 by 11/30/99”
  - “Nuke capable terrorists by 2000”
  - “Mark McGwire hits more than 61 home runs”
- Hollywood Stock Exchange
  - security payoff on box office gross during first 4 weekends
  - other entertainment bets
- Above are not for real money
**HP sales forecasting**
- Chen and Plott (1998)
- Arrow-Debreu securities
  - payoff contingent on sales of HP printers
  - internal to HP
  - real-money bets
- Consistently better than HP forecasts

**Securitization**
- David Bowie bonds = $55 million
- Catastrophe bonds
  - $477 million bonds tied to 1997 East Coast hurricane
  - $137 million bond tied to California earthquake
- Relationship to insurance markets?
- Relationship to online trading?

**Conclusions**
- Electronic trading is here to stay
- Exotic markets are useful forecasting tools
- Electronic agents will be used, but may well be passive
- Transparency is important
- Securitization will thrive