

# Lecture 19: Brokers, Dealers, Exchanges & ECNs

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# Brokers, Dealers Exchanges & ECNs

- Broker-Dealer (BD) is an organization as defined by SEC, hires natural persons as brokers and dealers, its registered representatives
- An exchange is a private association of brokers regulated (in the U.S.) by the SEC
- Electronic Communications Networks (ECNs) allow investors to communicate with each other, and to exchange: Archipelago (now part of NYSE), BATS, Direct Edge.

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# Brokers

**Brokers act on behalf of  
Others as their  
Agent for which they earn a  
Commission**

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# Dealers

A **D**ealer always acts for  
**H**erself, in other words as a  
**P**rincipal in the transaction for which she  
makes a  
**M**arkup

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# The Traditional Four Markets

- First Market: NYSE
- Second market: NASDAQ National Market (replaced the “pink sheets” in 1971)
- Third market: Nasdaq small cap
- Fourth market: large institutions trade amongst themselves without the use of a securities firm

# Exchanges

- New York Stock Exchange, established 1792 by the Buttonwood Agreement among 24 brokers.
- Exchanges provide standards and codes of ethics for broker members, standards for stocks.
- Exchanges must register and are regulated by SEC
- National Best Bid Offer (NBBO) via Intermarket Trading System (ITS)
- Regional Exchanges: Philadelphia Exchange, Cincinnati Exchange now National Stock Exchange
- Listing requirements for stocks. Delisting too.

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# Intermarket Trading System (ITS)

- Securities Act of 1975 called for a national market system
- In response to this act, the ITS, an electronic system, was opened in 1978. Displays quotes on all exchanges where a stock is listed or where traded under UTP (unlisted trading privileges)
- When a BD enters a trade, it is automatically routed via ITS to exchange with best price, via Consolidated Quote System, though slowly
- BDs may send trade instead to an ECN for “payment for order flow”
- Increasingly impatient investors may be happy to put trades to ECNs for fast execution. They may suffer from poor execution
- NMS Linkage proposed to replace ITS by all major US stock exchanges in 2006.(no news that it is implemented)

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# Electronic Communications Networks

- ECNs (sometimes called Alternative Trading Systems, ATS) are regulated by the SEC essentially as broker dealers (BDs), which puts them in a (slightly) different category from exchanges
- Tend to handle over the counter (OTC) (small volume) securities
- ECNs started as basically web sites for traders created by young computer geeks, but increasingly functioned more as exchanges
- New SEC rules January 1997 made ECNs important by granting them access to Nasdaq National Market system
- Archipelago founded 1996 in anticipation of new rules
- Instinet: for professionals. Until 1999, it was the biggest ECN. In 2004 it ceased being an ECN and is now a broker-dealer.
- Island: for individuals, became the biggest ECN. In 1999 it did 4.9% of all Nasdaq trading volume.

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# NYSE-ArcaEx Merger, 2005

- April, 2003 Archipelago was trading 8,800 stocks
- April 20, 2005, NYSE, then trading 2,744 stocks, and ArcaEx announced they would merge to form the NYSE Group
- NYSE now trading Nasdaq stocks
- After NYSE-ArcaEx merger and Nasdaq-INET merger, worries emerge about a duopoly situation in US stock market

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# NYSE-EuroNext merger 2006

- So it went from NYSE to NYSE Group, Inc., to NYSE Euronext, Inc.
- NYSE likely to buy AMEX, 2008

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# Kinds of Orders

- Market Order
- Limit Order
- Stop Loss Order
  - Market orders dangerous for thinly-traded stocks
  - ECNs may not allow market orders

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# Gambler's Ruin Problem

- Starting with  $\$S$ , betting  $\$1$  on heads on a coin toss with probability  $p$  of coming up heads, continuing to toss until ruin, probability of eventual ruin equals 1 if  $p$  is less than or equal to one half, otherwise equals  $((1-p)/p)^s$ :

$$\left( \frac{1-p}{p} \right)^s$$

# Gambler's Ruin Derivation

- Call probability of ever failing, playing forever, given that one has  $S$  dollars today  $\Pr(S)$ . Then  $\Pr(S) = p\Pr(S+1) + (1-p)\Pr(S-1)$  and note that  $\Pr(0) = 1$ .

$$\Pr(S) = p\Pr(S+1) + (1-p)\Pr(S-1)$$

$$\Pr(0) = 1$$

$$\therefore \Pr(S) = \left(\frac{1-p}{p}\right)^S$$

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# Optimal Bid-Asked Spread

- Dealer must set a bid-asked spread in consideration of the ultimate probability of ruin and dealer's utility weighting of this outcome
- Dealer has inferior information, expects to be “picked off” by superior traders.
- Must set bid-asked spread so that the amount of gain from spread offsets the expected loss.