Lecture 3-4: Equities: Markets

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III. Terminology.
IV. Types of Orders:
V. Secondary Equity Markets in the U.S..
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VII. Discussion
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Lecture 3-4: Equities: Markets

I. Reading.
   A. BKM Chapter 2: Sections 2.3-2.4.
   B. BKM Chapter 3: Sections 3.1-3.5 and 3.8 are the most closely related to the material covered here.
   C. Useful websites
      1. NYSE: http://www.nyse.com
      2. NASDAQ: http://www.nasdaq.com
II. Primary Equity Markets in the U.S..
   A. Primary market: Shares are issued by a firm that receives the proceeds from the sale.
   B. Investment banks are usually used as intermediaries.
      1. A firm wishing to sell securities listens to presentations by investment banks and then chooses one to be the lead underwriter.
      2. The underwriter then contacts potential buyers.
   C. Underwriting Agreement:
      1. Firm-commitment: the investment bank purchases the shares from the issuing company and then resells them.
         a. The investment bank pays a purchase price lower than the public offering price: the spread serves as compensation for the underwriter.
         b. The investment bank bears the risk of not being able to resell the stock at the offer price.
      2. Best-efforts: the investment bank agrees to help the firm sell the securities but does not actually purchase the securities.
         a. The investment bank does not bear the risk of being unable to find buyers for the stock at the offer price.
         b. Less common than firm-commitment.
   D. Two Types of Issues:
      1. Public offerings: an issue of stock sold to the general investing public that can then be traded on the secondary market.
         a. Initial: an issue of stock by a formerly privately-owned company selling stock to the public for the first time.
            (1) Underpricing: leads to high returns on the first day of listing.
            (2) Long-run under-performance over next 5 years.
         b. Seasoned: an issue of stock by a company that has already sold stock to the public.
      2. Private placements: an issue of stock sold to a few wealthy or institutional investors.
Figure 3.3  Average initial returns for IPOs in various countries


Figure 3.4  Long-term relative performance of initial public offerings

III. Terminology.
   A. Bid Price:
      1. Price at which an intermediary is ready to purchase the security.
      2. Price received by a seller.
   B. Asked Price:
      1. Price at which an intermediary is ready to sell the security.
      2. Price paid by a buyer.
   C. Spread:
      1. Difference between bid and asked prices.
      2. Bid price is lower than the asked price.
      3. Spread is the intermediary’s profit.

<table>
<thead>
<tr>
<th>Investor</th>
<th>Price</th>
<th>Intermediary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy</td>
<td>Asked</td>
<td>Sell</td>
</tr>
<tr>
<td>Sell</td>
<td>Bid</td>
<td>Buy</td>
</tr>
</tbody>
</table>

IV. Types of Orders:
   A. Market Orders: simple buy or sell orders that are to be executed immediately at current market prices.
   B. Limit Orders: provide liquidity to the market.
      1. A limit buy order says that if the price falls below a certain price then buy the stock.
      2. A limit sell order says that if the price goes above a certain price then sell the stock.
   C. Stop-loss Orders
      1. A stop-loss buy order says that if the price goes above a certain price then buy the stock.
      2. A stop-loss sell order says that if the price falls below a certain price then sell the stock.

Example: The closing price for IBM on Friday 1/31/04 is 92.89. A limit order to buy IBM stock at 92 tells the broker to buy if the price of IBM falls to 92 or below. A stop-loss order to buy IBM stock at 93 tells the broker to buy if the price of IBM rises to 93 or above. A limit order to sell IBM stock at 93 tells the broker to sell if the price of IBM rises to 93 or above. A stop-loss order to sell IBM stock at 92 tells the broker to sell if the price of IBM falls to 92 or below.
V. Secondary Equity Markets in the U.S.
   A. Secondary market: already-issued shares are traded.
   B. Exchanges.
      1. National:
         a. NYSE: largest.
         b. AMEX.
      2. Regional: several.
      3. Some stocks trade both on the NYSE and on regional exchanges.
      4. Most exchanges have listing requirements that a stock has to satisfy.
      5. Only members of an exchange can trade on the exchange.
      6. Exchange members execute trades for investors and receive commission.
   C. Over-the-Counter Market.
      1. NASDAQ
         a. the major over-the-counter market.
         b. utilizes an automated quotations system which computer-links dealers (market makers).
         c. dealers:
            (1) maintain an inventory of selected stocks; and,
            (2) stand ready to buy a certain number of shares of stock at their stated bid prices and ready to sell at their stated asked prices.
            (3) required to reveal customer limit orders if better than their stated bid and ask prices.
         d. no centralized trading floor.
         e. individuals hire brokers to find the dealer offering the best deal.
         f. SuperMontage:
            (1) is NASDAQ’s integrated order display and execution system.
            (2) aggregates limit orders at all price levels and makes available the best 5 prices on both sides of the market.
            (3) ideally, would serve as a central order book for all NASDAQ-listed securities, but to fill this role, needs participation of all important traders.
   D. Third Market: refers to the trading of exchange-listed securities on the over-the-counter market.
E. Fourth Market. Direct trading between investors in exchange-listed or Nasdaq-listed stocks without using a broker.
   1. Electronic communication networks or ECNs allow members to post buy or sell orders that are “crossed” with orders of other members.
      a. ECNs have captured a large fraction of the trading volume of NASDAQ-listed stocks: around 40%.
      b. ECNs provide traders with anonymity.
      c. ECNs must be certified by the SEC and registered with NASDAQ to participate in the NASDAQ market.
      d. Two of the biggest ECNs are Island/Instinet and Archipelago.

F. Intermarket Trading:
   1. A “Consolidated Tape” reports trades on the NYSE, the AMEX, and the major regional exchanges as well as on NASDAQ stocks.
   2. The Intermarket Trading System links several markets by computer (NYSE, AMEX, Boston, Cincinnati, Midwest, Pacific, Philadelphia, the Chicago Board Options Exchange, and the NASD); brokers and market makers can thus display quotes on all markets and execute cross-market trades.
Island's book in IBM, Jan. 29, 2001

Bid

As of 10:26:44

September 20, 2004

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... and a few minutes later

A likely scenario:

Seller(s), using market orders, took out the 113.25 bid and the 113.00 bid, leaving 112.5 as the best bid.

On the sell side of the book, sellers realized that 113.375 was unrealistically high.

They're now offering at a lower price (112.95)
VI. Trading on the NYSE.

A. Participants: 4 types of members
1. Commission Brokers: execute orders that the public has placed with brokerage firms.
2. Floor Brokers: assist commission brokers when there are too many orders flowing into the market.
3. Floor Traders: trade solely for themselves.
4. Specialists: maintain a market in one or more listed stocks.

B. Role of the Specialist:
1. maintain a “book” of all unfilled limit orders entered by brokers on behalf of customers.
2. when the highest outstanding limit buy order exceeds the lowest outstanding limit sell order: execute or “cross” the trade.
3. be willing at any time to buy at her listed bid price and sell at her listed asked price.
4. maintain a “fair and orderly market” by trading in the stock personally.

C. How does the Specialist Set Prices?
1. The Specialist is constantly searching for the price that makes the flow of shares bought and sold in the market the same.
2. The Specialist’s inventory plays a key role:
   a. If inventory increases, it means that there are more sell orders than buy orders, and the Specialist lowers the price.
   b. If inventory decreases, it means that there are more buy orders than sell orders, and the Specialist raises the price.
3. In general, NYSE specialists do not take a view of where a stock is going over time. They are not in the business of long-term investing but rather of making money from buying and selling while maintaining as little inventory as possible.
C. Effective Price
   1. bid price: the higher of the specialist’s bid price and the highest unfilled limit buy order.
   2. asked price: the lower of the specialist’s asked price and the lowest unfilled limit sell order.

D. Example.
   1. The specialist’s book for a stock looks as follows:

<table>
<thead>
<tr>
<th>Price</th>
<th>Limit Sell</th>
<th>Limit Buy</th>
<th>Specialist</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.6</td>
<td>100 sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.5</td>
<td>100 sh</td>
<td>100 sh</td>
<td>bid</td>
</tr>
<tr>
<td>90.4</td>
<td></td>
<td>100 sh</td>
<td></td>
</tr>
<tr>
<td>90.3</td>
<td></td>
<td></td>
<td>100 sh</td>
</tr>
</tbody>
</table>

   Will any trades take place, given this book? Answer: Yes. The limit sell for 100 shares at 90.5 will cross with the limit buy for 100 shares at 90.5.

   2. The book now looks as follows:

<table>
<thead>
<tr>
<th>Price</th>
<th>Limit Sell</th>
<th>Limit Buy</th>
<th>Specialist</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.6</td>
<td>100sh</td>
<td></td>
<td>asked</td>
</tr>
<tr>
<td>90.5</td>
<td></td>
<td></td>
<td>bid</td>
</tr>
<tr>
<td>90.4</td>
<td></td>
<td>100 sh</td>
<td></td>
</tr>
<tr>
<td>90.3</td>
<td></td>
<td></td>
<td>100 sh</td>
</tr>
</tbody>
</table>

   a. If a market sell order for 100 shares comes in, at what price will it execute? Answer: The higher of the highest limit buy (90.4) and the specialist’s bid price (90.5). So 90.5.
   b. If a market buy order for 100 shares comes in, at what price will it execute? Answer: The lower of the lowest limit sell (90.6) and the specialist’s asked price (90.6). So 90.6.
E. How the specialist determines her asked and bid prices: 2 examples.

1. Example: The specialist’s obligation to maintain an orderly market.
   a. The specialist’s book for a stock looks as follows:

<table>
<thead>
<tr>
<th>Price</th>
<th>Limit Sell</th>
<th>Limit Buy</th>
<th>Specialist</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.8</td>
<td>100 sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.7</td>
<td>100 sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.6</td>
<td>100 sh</td>
<td></td>
<td>asked</td>
</tr>
<tr>
<td>90.5</td>
<td>100 sh</td>
<td></td>
<td>bid</td>
</tr>
<tr>
<td>90.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.3</td>
<td></td>
<td>100 sh</td>
<td></td>
</tr>
<tr>
<td>90.2</td>
<td></td>
<td>100 sh</td>
<td></td>
</tr>
</tbody>
</table>

   Suppose a market sell for 100 shares arrives. It will get executed at 90.5.
   b. The book now looks as follows:

<table>
<thead>
<tr>
<th>Price</th>
<th>Limit Sell</th>
<th>Limit Buy</th>
<th>Specialist</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.8</td>
<td>100 sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.7</td>
<td>100 sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.6</td>
<td>100 sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.4</td>
<td></td>
<td></td>
<td>bid</td>
</tr>
<tr>
<td>90.3</td>
<td></td>
<td>100 sh</td>
<td></td>
</tr>
<tr>
<td>90.2</td>
<td></td>
<td>100 sh</td>
<td></td>
</tr>
</tbody>
</table>

   Suppose another market sell for 200 shares arrives.
   c. If the specialist does not offer a better bid, 100 shares of the sell order will get executed at 90.3 and the other 100 at 90.2. Although the specialist may be concerned about the possibility of bad news, her responsibility to maintain an orderly market may obligate her to post a bid of 90.4 and take the other side of the trade.
2. Example: The specialist’s ability to profit from observing the order flow.
   a. The specialist’s book for a stock looks as follows:

<table>
<thead>
<tr>
<th>Price</th>
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<th>Limit Buy</th>
<th>Specialist</th>
</tr>
</thead>
<tbody>
<tr>
<td>90.8</td>
<td>100 sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.7</td>
<td>100 sh, 200 sh, 200sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.6</td>
<td>100 sh, 100 sh, 200 sh</td>
<td>asked</td>
<td></td>
</tr>
<tr>
<td>90.5</td>
<td>100 sh, 200 sh, 200sh</td>
<td>bid</td>
<td></td>
</tr>
<tr>
<td>90.4</td>
<td>100 sh, 200 sh, 200sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.3</td>
<td>200 sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   Suppose limit sell orders for 300 shares at 90.6 and 400 shares at 90.7 are withdrawn. The implication is possible good news about the stock.

   b. The book now looks as follows:

<table>
<thead>
<tr>
<th>Price</th>
<th>Limit Sell</th>
<th>Limit Buy</th>
<th>Specialist</th>
</tr>
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<tbody>
<tr>
<td>90.8</td>
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<td></td>
<td></td>
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<tr>
<td>90.7</td>
<td>100 sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.6</td>
<td>100 sh</td>
<td>bid</td>
<td></td>
</tr>
<tr>
<td>90.5</td>
<td>100 sh, 200 sh, 200sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.4</td>
<td>100 sh, 200 sh, 200sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.3</td>
<td>200 sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   Suppose a market sell for 100 shares arrives.
   c. If the specialist does not offer a better bid, the sell order will get executed at 90.5
   d. However, based on the order flow the specialist may prefer to bid 90.6 and take the other side of the trade. She may think it is a good bet given the large quantity of limit buy orders at 90.5 and 90.4 (limited downside) and the evaporation of limit sell orders at 90.7 and 90.6 (potential for upside gain).
F. Block Trades
   1. Definition: If an investor wishes to trade more than 10000 shares of a NYSE stock, it is known as a block trade.
   2. As of 2001, block trades constitute about 50% of trading volume on the NYSE.
   3. Block houses have evolved to help in the placement of block trades.

G. The SuperDOT System
   1. SuperDOT enables exchange members to send orders directly to the specialist over computer lines.
   2. Most trades are executed and reported back to the originating member within 2 minutes.
   3. Most orders handled are small; so although a large fraction of all orders are handled by SuperDOT, these only account for a small fraction of trading volume.
VII. Discussion
   A. Market Order versus Limit Order
      1. Trade-off between immediacy and price
         a. Market order gets executed immediately but usually buys are at the asked and sells are at the bid
         b. Limit orders don’t get executed immediately but the price is usually better than that obtained by a market order.
   B. Determinants of the Bid-ask Spread
      1. Volume of trade: higher volume means lower spreads since risk associated with holding inventory is lower.
      2. Volatility of equilibrium price: higher volatility means higher spreads since risk associated with holding inventory is higher.
      3. Competition between market markers: greater competition means lower spreads
         a. NASDAQ trading reforms of 1997 designed to improve competition between dealers.
   C. Trading Costs
      1. Commission:
         a. Fee paid to the broker for making the transaction.
      2. Bid-Ask Spread:
         a. Cost of immediacy usually paid to the market maker.
         b. Incurred when using a market order.
   D. Motivations for Trading.
      1. Information: You believe that you have information about the asset that is not reflected in price.
      2. Liquidity: You have surplus cash to invest (and you will buy securities) or you need to raise cash (and you will sell securities).
      3. Rebalancing: The composition of your investment portfolio has changed due to differences in the performance of the assets currently in the portfolio. You want to readjust the composition to reflect your risk preferences.
E. NYSE vs OTC market

1. NYSE has higher fixed costs (due to the need for a central physical location), lower per-trade costs (since more likely to be trading with another investor and not a market maker) and greater structure (rules and regimentation).

2. The higher fixed costs for the NYSE means that a stock must have an active market to cover these costs; this is why the NYSE has stringent listing requirements.

3. The distinction is becoming blurrier:
   a. NASDAQ has listing requirements like an exchange.
   b. NASDAQ order handling rules since 1997 force dealers to display customer limit orders allowing one customer to trade with another customer.
VIII. Decimalization.

A. Two issues:
1. Quoting prices in decimals.
2. Minimum tick size becomes 1 cent rather than 1/8 or 1/16.

B. Dates:
1. Island: July 2000.

C. Effects:
1. Spreads narrower particularly for active stocks.
   a. Impatient market orders benefit.
   b. Limit order traders are disadvantaged
   c. NASDAQ dealers are harmed.
   d. Institutional investors are harmed
2. Specialist will trade more often and more profitably: easier to “step ahead” of limit orders to exploit her information about order flow.