Lecture Notes 4a

Equities: Characteristics and Markets

I. Readings and Suggested Practice Problems

II. Secondary Stock Markets in the U.S.

III. Trading on the NYSE

V. Return Calculation and Dividends

VI. Additional Readings

Buzz Words: Exchanges, OTC, ECN, Specialist, Limit Order Book, Market vs Limit Buy/Sell, Order Flow, Call vs Continuous Auctions, Ex-date
I. Readings and Suggested Practice Problems

BKM Chapter 2: Sections 2.3, 2.4; BKM Chapter 3: Sections 3.1-3.5
Suggested Problems, Chapter 2: 8, 11; Chapter 3: 7, 9(a),(b), 22

Web: www.island.com/bookviewer/index.asp, click on the Java Viewer, enter a stock (e.g., MSFT, IBM, or GE) and watch it trade.

II. Secondary Stock Markets in the U.S.

A. Exchanges

   Regional: several small exchanges (e.g. Pacific, Philadelphia)
   Some stocks trade both on the NYSE and regional exchanges.

2. Most exchanges have listing requirements that a stock has to satisfy. Only members of an exchange can trade on the exchange. Exchange members execute trades for investors and receive commission.

B. Over-the-Counter Market

National Association of Securities Dealers-National Market System (NASD-NMS) is the major over-the-counter market.
Utilizes an Automated Quotations system (NASDAQ) which links dealers (market makers). [http://www.nasdaq.com/]

Dealers: maintain an inventory of selected stocks; and, 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. Your Broker should search for a Dealer with the best quotes.

Investors can trade directly using an ECN: Electronic Communication Network (like Island ECN).
III. Trading on the NYSE

Specialists: maintain a market in one or more listed stocks (one specialist per stock, which is one reason for the name).

A. Types of Orders

1. Market Orders
   simple buy or sell orders that are to be executed immediately at current market prices.

2. Limit Orders
   A limit buy order says that if the price falls below a certain price then buy the stock.
   A limit sell order says that if the price goes above a certain price then sell the stock.

Example
The closing price for IBM on 9/22/03 is $91.4.

A limit order to buy at $91 tells the broker to buy if the price of IBM falls to $91 or below.
A limit order to sell at $91 tells the broker to sell if the price of IBM rises to $91 or above.

B. Settlement

An order executed on the exchange is settled within 3 days (referred to as T+3).
C. What’s Special About the Specialist?

**Role of the Specialist: Responsibilities and Prohibited Acts**

1. Must maintain a “fair and orderly market,” in particular, by trading in the stock from his/her own account.

2. Must post quotes (even when no one else does), and be willing at any time to buy at the bid price and sell at the asked price.

3. Must maintain a “book” of all unfilled limit orders entered by brokers on behalf of customers.

4. Must maintain price continuity; when the highest outstanding limit buy order exceeds the lowest outstanding limit sell order, must execute or “cross” the trade.

5. Cannot trade ahead of customers (must always yield to customer orders), and cannot trade in a destabilizing fashion.
Foundations of Finance: Equities: Characteristics and Markets

**Example**

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>90.87</td>
<td>100 sh</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90.62</td>
<td>100 sh</td>
<td></td>
<td>asked</td>
</tr>
<tr>
<td>90.50</td>
<td>100 sh</td>
<td>100 sh</td>
<td>bid</td>
</tr>
<tr>
<td>90.37</td>
<td></td>
<td>100 sh</td>
<td></td>
</tr>
<tr>
<td>90.25</td>
<td></td>
<td>100 sh</td>
<td></td>
</tr>
</tbody>
</table>

*Will any trades take place, given this book?* (this can be the day-start *call* auction)
Answer: Yes. The limit sell for 100 shares at 90.50 will cross with the limit buy for 100 shares at 90.50. The book now looks as follows:

<table>
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<td></td>
<td>100 sh</td>
<td></td>
</tr>
</tbody>
</table>

*If a market sell order for 100 shares comes in, at what price will it execute?*
Answer: The higher of the highest limit buy (90.37) and the specialist’s bid price (90.50). So 90.50. (This is an example for price setting using a *continuous* auction).

*If a market buy order for 100 shares comes in, at what price will it execute?*
Answer: The lower of the lowest limit sell (90.62) and the specialist’s asked price (90.62). So 90.62.
IV. Return Calculation and Dividends

A. Return Calculation

Return over a Period: Percentage change in the value of the investment over that period. (Typical notation: $R$, $r$, $R(t)$, $r(t)$, etc…)

Return of an arbitrary asset $i$, from $t$ to $t+1$, is calculated as follows:

$$r_i(t, t+1) = \frac{p_i(t+1) + c_i(t+1) - p_i(t)}{p_i(t)}$$

$$= \frac{p_i(t+1) + c_i(t+1)}{p_i(t)} - 1$$

where $p_i(t+1)$ is the market price of asset $i$ at time $t+1$; $c_i(t+1)$ is the cash flow from the asset at time $t+1$; $p_i(t)$ is the market price of asset $i$ at time $t$; and, $r_i(t, t+1)$ is the return on asset $i$ over the period from $t$ to $t+1$.

Example

Consider the following price data for IBM:

<table>
<thead>
<tr>
<th>Date</th>
<th>Dividend: IBM</th>
<th>Closing Price: IBM</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/30</td>
<td>0</td>
<td>148.50</td>
</tr>
<tr>
<td>11/06 (Ex-date)</td>
<td>0.22</td>
<td>149.94</td>
</tr>
<tr>
<td>11/13</td>
<td>0</td>
<td>157.44</td>
</tr>
</tbody>
</table>

What is the 1-week return on IBM stock from 11/6 to 11/13?

Answer:

$$r_{IBM}(11/6, 11/13) = \frac{P_{IBM}(11/13) - P_{IBM}(11/6)}{P_{IBM}(11/6)}$$

$$= \frac{157.44 - 149.94}{149.94} = 0.05 \text{ or } 5.00\%$$
B. Dividends

1. Important Dates associated with a Dividend
   
   a. Declared Date: when the board formally approves the dividend.
   b. Ex-date: when the stock first trades without its dividend.
   c. Record Date: when the firm looks at its list of shareholders to see who actually owns the stock (it will be Ex-date + 2 business days).
   d. Payable Date: when the check actually “gets mailed.”

2. Example
   Consider the following information for a $0.35 second-quarter dividend of IBM.

<table>
<thead>
<tr>
<th>Declared date</th>
<th>Ex-date</th>
<th>Record date</th>
<th>Payable date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul 30</td>
<td>Aug 7</td>
<td>Aug 9</td>
<td>Sep 10</td>
</tr>
</tbody>
</table>

   The stock trades without the dividend from the start of trading on Aug 7 (to receive the dividend, must buy/own the stock on the close of the day before the Ex-date).

   It takes 3 business days for an NYSE trade to settle. If you buy IBM stock on Tuesday 8/6, you will received the stock by the Friday 8/9 and so will receive the dividend.

   If you buy IBM stock on Wednesday 8/7, you will not receive the stock by the Friday 8/9 and so will not receive the dividend.
3. **Return Calculation with Dividend**

**Example**

*Based on price information for IBM on 10/30 and 11/06, what is the 1-week return on IBM from 10/30 to 11/06?*

**Answer:**

Based on the Bloomberg data page, 11/06/98 is the ex-date for a dividend payment of $0.22 per share. Hence, owning IBM stock during the week of 10/30 to 11/06, and in particular at the close of the business day prior to the ex-date, provides ownership of the dividend payment. The owner, selling on the ex-date receives the dividend, and the weekly return is therefore given by:

$$ r_{IBM} (10/30,11/6) = \frac{p_{IBM} (11/6) + Div_{IBM} (11/6) - p_{IBM} (10/30)}{p_{IBM} (10/30)} $$

$$ = \frac{149.94 + 0.22 - 148.5}{148.5} = 0.0112 \text{ or } 1.12\% $$
DIVIDEND/SPLIT SUMMARY

Bloomberg prints for IBM

See notes distributed in class
V. Additional Readings

The following articles discuss:

• Specialists

• Electronic Communications Networks (ECNs) and their impact on Market Structure

• How one can trade stocks on-line

• Stock Splits

• SEC investigations

• Transition to Decimals after some 300 years of fractions

• And More…