Introduction

Advanced Investment
FOMGT 421
Week 1
Introduction

• Advanced Investments: FOMGT 421
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Course Requirement

• Prerequisite: FOMGT 310 and 320.

• Regular Homeworks (30%).
  – The homeworks require considerable time and energy, especially in the first half of the course. It will involve hands-on work with financial data, and applications of the material covered in class.

• Exams: Midterm + Final (50%).

• Cases: (20%).

• The homework and cases can be attempted in groups, with a maximum size of 3.
Overview of Class (1/2)

• Emphasis on equity markets, using portfolio theory as a conceptual framework for understanding both asset allocation decisions and performance analysis.

• Mostly dealing with equity markets, with a brief introduction non-equity investments (alternative investments like hedge funds, etc.).

• Considerable amount of data work - course assumes basic working knowledge of a spreadsheet like Excel, especially in first half of class.
Overview of Class (2/2)

- Cases will deal with understanding some of the important issues that arise in investment management.
- Book: Bodie, Kane and Marcus.
- Brief notes will also be available on my website: http://www-unix.oit.umass.edu/~nkapadia/courses.html.
Basic Questions of Investment Management

• 1. If you are a portfolio manager managing money, what decisions need to be made?

• 2. If you are investing money with a portfolio manager, what questions should you ask (and, hopefully, answer)?
Some Issues

• 1. How should the money be allocated across asset classes [stocks, bonds, hedge funds?]
• 2. Passive or active management?
• 3. What about market timing?
• 4. What value is added by a portfolio manager?
  – Active vs. Passive
• 5. How does one evaluate the manager’s performance?
The Starting Point:
The Market Index

1. An equity market index may be viewed as the price of a portfolio of stocks, normalized in some way.
   Different indices differ in their composition (in both the names of the stocks, and their weights).

2. Examples of equity indexes.
   - Foreign indices: FTSE, Nikkei, Hang Seng.

3. Why are stock market indices (indexes) useful?
   - As a short-hand way of keeping track of market.
   - Can serve as a passive investment strategy.
   - As a benchmark to evaluate other strategies/managers.
Equity Indexes

2. How do we compare one index with another:
   – What kind of stocks?
     • Name a stock that is in Nasdaq but not in the Dow (eg. CSCO).
     • Name a stock that is in the Dow, but not in Nasdaq (eg. IBM).
   – What kind of weights to each stock?
     • Find a stock that is represented in two of your favorite indexes. Compare their weights in both these indexes. (MSFT has a weight of 12.48% in NASDAQ (on 1/2/03) but 4.20% in the Dow).
     • [Only two NASDAQ stocks are in the DOW. MSFT is one – which is the other one?].

3. How do differences in indexes matter?
   – Both returns and volatilities differ because of compositional differences.
Weight of a Stock in a Portfolio

• The weight of a stock in a portfolio is the fraction of dollars invested in the stock, relative to the total amount invested in the entire portfolio.

  – Example: Suppose on 23/1/2003, a portfolio that replicates the Dow Jones Industrial Average has $1,185.93 million invested in it. Of this, $126.25 million is invested in MMM. Therefore, the weight of MMM in the Dow is:

\[
\text{Weight of MMM in DOW} = \frac{126.25}{1,185.93} = 10.6541\%.
\]
The 5 Stocks With Largest Weight in the Dow (As of 1/23/2003)

• Johnson and Johnson  4.52%
• United Technologies  5.39%
• IBM                6.66%
• P&G                 7.10%
• MMM                10.65%
The 5 Stocks With Largest Weight in the S&P 500 (As of 1/3/2003)

- Pfizer 2.32%
- Wal-Mart 2.72%
- XOM 2.85%
- GE 3.03%
- MSFT 3.43%
The 5 Stocks With Largest Weight in the Nasdaq (As of 1/3/2003)

- AMGN 3.73%
- CSCO 4.44%
- QCOM 4.44%
- INTC 4.88%
- MSFT 12.48%
Calculating Returns

- Example: The Dow closed at 8088.84 on Tuesday, January 28, 2003. The previous (business day), it closed at 7,989.56.
- The one-day return is (approximately) \( \frac{8,088.84-7,989.56}{7,989.56} = 1.24\% \).
- Note that this is approximate, because we have ignored any dividends that may have been paid to the companies making the index.
- This is the return over 1 business day.
Reporting Returns on Annualized Basis

• By convention, we often report average returns on an annualized basis.

• Suppose the average monthly return over the last 10 years for an index is 0.01%.

• The annualized average return is then:
  \[ (1 + 0.01)^{12} - 1 = 12.68\% . \]

[Qt: How would you annualize a daily return?].
Calculating Volatility

• The volatility of a stock’s return is defined as its standard deviation.

• For example, if we calculate the standard deviation of daily returns of the DJIA over 2002, we get the volatility as 1.61%.
  – To calculate this number, use the “stdev” function in Excel.

• By convention, we also report this on an annualized basis.
Annualizing Volatility

- Suppose we measure volatility over using N data points. Let T be the period over which we want to report the volatility. Then, to convert the standard deviation from N to T, we multiply by \( \sqrt{\frac{T}{N}} \).

- Example: Suppose the volatility of the DJIA measured from daily returns is 1.61%. Suppose we want to report the volatility on an annualized basis. Then, for us, \( N=1 \). \( T=252 \). So, the annualized volatility is: \( 0.0161 \times \sqrt{252} = 25.59\% \).

- If, instead, we had measured the volatility using monthly return data, we would annualized by multiplying by \( \sqrt{12} \).