Chap 2 Stock Market Indices

- Why we care:
- ***Gives us an historical perspective*** of returns (and risk). The Crash of '87 - the Dow fell 501 points.
- ***Allows investors to compare their results with that of the "market***". Usually shows them that they are not beating the market.
- ***Used in trading decisions: especially technical analysis***. The "Dow" was invented for use in detecting ***bull or bear markets***.
- 1/14/2003

Stock Market Indices

- We will focus on equity indices. ***These usually measure only price changes - not total return.***
- The ***Dow Jones Industrial Average*** is the oldest index (1890) and possibly the most followed.
- It is also the most screwed up.
- The DJIA, along with the transports and utility average are ***simple price averages*** -
- The fancy definition is a ***price-weighted index***.
- Charles Dow wanted, in 1890, to have a measure of "the market" that was ***very easy to compute***.

Price-Weighted Stock Market Indices

- The DJIA, along with the DJTA, is used in the ***Dow Theory***, an example of ***trend analysis***.
- This measure would tell Dow whether the average stock was going up (a ***bull market***) or down (a ***bear market***).
- ***Problems with the DJIA as a market indicator include***: (1) ***Only 30, older, stocks*** in the average.
- (2) The DJIA is ***oddly adjusted for stock splits*** (splits lower the numerator), by lowering the denominator, so that the average is unaffected.
- (3) Changes in the value of ***high-priced stocks tend to dominate the index***.

Price-Weighted Stock Market Indices

- We see that the Dow is simply an average of 30 prices.
- $\mathbf{DJIA_t} = \sum \mathbf{P_{i,t}} / \mathbf{n^*}$ ***where i = 1, 30***
- Suppose MMM is selling for $126 a share and Intel is selling for $18 a share.
- MMM then doubles and Intel goes to zero.
- We must then add $110 to and subtract $18 from the top of the equation. ***So the DJIA rises***.
- Thus, MMM (Mkt Value $49 Billion) influences the Dow much more than Intel (Mkt. Value $115 Billion) .
- **n*** is ***adjusted downward*** every time a Dow stock splits.
- **n*** has gone from an original 30 to about 0.25

Value-Weighted Stock Market Indices

- The next most followed index is the Standard and Poor's 500. This index is a ***value-weighted index*** - the most common (and, I think, sensible) method of index construction.
- Value-weighted indexes are also called ***market-weighted indexes.***
- The ***market value of a stock*** is computed as the ***closing price times the number of shares outstanding*** (P x Q).
- This is expression often called the ***stock's capitalization or "cap"*** - but is not to be confused with the firm's capital structure.

Value-Weighted Stock Market Indices

- The expression for the value-weighted index is a little more complex that that of a price average.
- $\mathbf{S\&P500_t} = \sum \mathbf{P_{i,t}}\,\mathbf{Q_{i,t}} / \sum \mathbf{P_{i,b}}\,\mathbf{Q_{i,b}}$ **(k)**
  ...
  where i = 1, 500 b is the base period,
  $\sum \mathbf{P_{i,b}}\,\mathbf{Q_{i,b}}$ ***was the total market value at time b, and k was set to 10 in 1943.***
- The top of the formula represents the ***total value of the 500 companies in the index***. The bottom represents the **value of the companies at the time the index was reset** – in 1942. The initial value of the index was ***arbitrarily*** set to ten (k)

Value-Weighted Stock Market Indices

- The ***value-weighted*** indexes are (deservedly in ***biased toward the companies with the highest stock market value***: a move in Intel will affect the S&P500 more than a move in MMM.
- The index is the ***sum*** of today's "***total cap"*** of the 500 stocks divided by the ***total cap"*** at the time the index was (re)created.
- This ratio is then multiplied by some initial value. In 1942-3, S&P reset its indexes to 10.

Value-Weighted Stock Market Indices

- Most indexes created over the last 40 years have been ***value-weighted*** and ***initially set at 100***.
- Examples: NYSE indices, S&P400 midcap, S&P600 midcap, ASE index, NASDAQ index.
- S&P500: ***sort of*** the largest 500 cap stocks
- S&P400 ***midcap***: the ***"next largest"*** 400 stocks
- S&P600 ***smallcap***: the "next largest" 600 stocks

Value-Weighted Stock Market Indices

- Russell 1000: the ***"largest"*** 1000 stocks
- Russell 2000: the ***"next largest"*** 2000 stocks. Many use portfolio managers the 2000 as their ***small-cap benchmark.***
- Russell 3000: the "largest" 3000 stocks and is the two Russell indexes put together. Question: Which Russell index (1000 or 2000) is the most important part of the Russell 3000?
- The NASDAQ index ***used to be considered a smallcap index. But it is now dominated by the likes of Intel, Microsoft, etc.***

Other Stock Market Indices

- The ***Wilshire 5000*** is ***value-weighted*** but has no denominator.
- In theory, ***the index is really the total value of all U.S.-based operating-company common stocks*** (so it does not include ADRs, ETFs, or CEFs etc.)
- The Index incorporates ***roughly*** all the U.S. companies that trade on the NYSE, AMEX and the NASDAQ.
- As new companies are added to these markets, they are also added to the Wilshire.
- Currently, the Wilshire 5000 represents over ***7000 companies. Attempts to give the total market cap of all US companies.***

Other Stock Market Indices

- Strangely, the ***Value Line Indexes*** are ***equally-weighted***. The price change of its ***1700 stocks*** (including some CEFs) count ***equally*** in calculating the price change of the ***Value Line*** indexes.
- The ***Value Line Index*** uses the ***geometric mean*** of the each of the 1700 stocks' return that day.
- There is also an ***arithmetic*** VL index, that is less followed. This index uses the simple average of the 1700 stocks' daily returns.
- ***Some people use the Value Line as measure of how the "typical" or median return is doing.***
- The VL indexes are considered ***small-cap indexes*** as ***most*** companies are "small"

Other Stock Market Indices

- ***Foreign Stock Indexes*** can follow any of the above construction methods.
- For Japan, the ***Nikkei-Dow 225*** follows the DJIA methodology (***price-weighted***). The ***broader Topix*** is ***value-weighted*** like the S&P500.
- Note: most ***foreign indexes are in the foreign currency.***
- The famous EAFE index (***Europe, Australia, Far East***) is an index compiled by Morgan-Stanley. ***USD-based,*** tracks stocks in the indicated regions.

Other Stock Market Indices

- Bond Indexes usually ***add back the interest income.***
- ***They represent a cumulative total return.***
- Equity indexes usually measure only ***price appreciation*** - thus they ***understate total return.***