Securities Markets - Characteristics of Security Indexes

The Three Predominant Weighting Schemes

In constructing stock market series, there are three predominant weighting schemes used:

1. Price Weighted Series

A price weighted series is the average of the stocks' prices in the series. It is calculated by adding together each stock price and dividing the total by the number of stocks in the series.

Formula

$$\textbf{Price weighted series} = \frac{\text{Sum of stock prices}}{\text{\# of stocks}}$$

The main problem that occurs with the price weighted series is the effect a price change in a high-priced stock will have on the series, as well as the lack of effect a low-priced stock will have on the series.

Two well-known examples of a price weighted series are the Sensex, Dow Jones Industrial Average and the Nikkei Dow Jones Stock Average.

2. Market Weighted Series

A market weighted series is the market value (stock price multiplied by shares outstanding) of each company in the series divided by a sum calculated in the base period. This amount is then multiplied by the base value.

Formula

$$\textbf{Market Weighted Series} = \frac{\text{Sum of current market values x beginning value}}{\text{Sum of base market values}}$$

Similar to the price weighted series, the major problem with the market weighted series is the effect a market value change in a large market cap stock will have on the series, as well as the lack of effect a small market cap stock will have on the series.

Well-known examples of a market-weighted series are the S&P 500 Index Composite, the New York Stock Exchange Index and the Financial Times Actuaries Share Indexes.

3. Unweighted Series

An unweighted series is based on the average price movement of the stock prices in the index. In this series, all stocks, no matter what the price, have the same effect on the series. To calculate the unweighted series, take an arithmetic average or a geometric mean of the relative returns.

Formula

$$\textbf{Unweighted price series} = (X_1 + X_2 + ... + X_n)^{1/n}$$

The Value Line Composite Average and the Financial Times Ordinary Share Index are examples of unweighted series.

Predominant Weighting Schemes Bias: Source and Direction

- **Price Weighted Series Bias:** Recall that the denominator of the price weighted series is the number of stocks with the stock price as the numerator. The problem occurs when a stock dividend or stock repurchase takes place. The numerator is adjusted to reflect the new stock price and the denominator needs to be adjusted to reflect the stock change. These changes tend to put a downward bias on the series as larger firms split their stock.

- **Market Weighted Series Bias:** As mentioned previously, large market cap stocks have a greater effect on the market weighted series relative to small market cap stocks. As such, swings in the value of the larger cap stocks will have a greater effect on the overall series.

- **Unweighted series Bias:** The calculation of an unweighted series can be done through an arithmetic or geometric average. But if a geometric average is used, there will be a downward bias relative to pricing as compared to the series calculation using the arithmetic average.

Securities Markets - Domestic vs. Global Indexes

An index measures the movement of a select group of stocks, based on size, industry, etc. It is also a gauge to measure the relative return on a specific stock within that index.

Domestic Stock Indexes

A domestic stock index is made up of domestic stock securities and can be based on various

components such as market cap, whether it is a value or growth index and many other components. The Dow Jones Industrial Average and the S&P 500 are good examples of domestic stock indexes. The Dow Jones Industrial Average is comprised of 30 domestic stocks selected by the Wall Street Journal. The S&P 500 index contains 500 domestic stocks. To be included in the index, a company must have a minimum market cap of $4 billion, be financially viable and have a public float of at least 50%.

Global Stock Indexes

A global stock index is similar to a domestic stock index except that it is made up of both domestic and international equity securities. An example of a global index is the S&P Global 1200. The index comprises securities in 29 countries. The key component for a security to be included in a global stock index is that it is tradable. For a global investor, this is a nice gauge to measure relative return.

Bond Indexes

Bond indexes are much trickier to construct than stock indexes. Given that there are typically many bonds issued for each company, there are many times more bond issues than stock issues to choose from. A bond index thus takes a sampling to create an index. An example of a bond index is the Lehman Brothers Aggregate Bond Index, which made up of 5,545 bonds across all segments of fixed income, including corporate, treasury and mortgage-backed segments.

Composite Stock-Bond Indexes

Composite stock-bond indexes are good proxies to measure a diversified stock/bond portfolio. These composites contain both stock and bond securities. The Merrill Lynch -Wilshire U.S. Capital Markets Index is an example of a composite stock-bond index.