Chapter 19: Performance Evaluation

Introduction

1. Performance evaluation involves measuring absolute returns, adjusting returns for risk, measuring relative returns, and performance attribution.

Measure Absolute Returns

1. Introduction
    a. Absolute Returns: returns achieved over a period of time, not considering risk or relative performance.
2. Holding-Period Returns
    a. Holding-Period Returns: measure the returns of a security over its holding period, which consists of the capital gain or loss resulting from change in price and income in the forms of dividends or interest.
3. Cash Flows and Time-Weighted Rates of Return
    a. Portfolios will generally have multiple cash flows over a holding period from both contributions/withdraws and dividends/interest. This makes measurement of returns difficult, and so holding periods can be broken down into periods, the beginning and end of which are marked by individual cash flows.
    b. Returns can be measured by calculating a form of average for these time periods. While arithmetic mean works, it does not take into account compounding. For this reason, geometric mean is most often used.
    c. Time-Weighted Rate of Return: a method of measuring performance using geometric mean that accounts for cash flows.
    d. Global Investment Performance Standards (GIPS): a set of methods for measuring performance that is widely used and has been adopted by the CFA Institute. GIPS uses time-weighted rate of return.

Adjust Returns for Risk

1. Standard Deviation
    a. Investment Risk, when considered in the sense of variability of returns, can be measured by standard deviation of returns. Obviously, higher standard deviations are associated with higher risk.
    b. Historical variability/standard deviations of returns are important to consider for two reasons:
        i. They may give some indication of how performance will vary in the future
        ii. Variance may have implications for an investor's ability to meet their financial requirements
2. Downside Deviation
    a. Downside deviation measures standard deviation of performance using only values that fall below the mean.

3. Reward-to-Risk Ratios
    a. Investors generally want investment portfolios that yield a higher return to risk ratio. The higher the ratio, the better the risk-adjusted-return. There are several methods for measuring return to risk. They include:
        i. Sharpe Ratio = (Portfolio Return - Risk-Free Return) / (Standard Deviation of Return)
            1. Risk-free rate is typically assumed to be the yield of a three? month treasury bond
        ii. Treynor Ratio = (Portfolio Return - Risk-Free Return) / (Beta)

Measure Relative Returns

1. Introduction
    a. Measuring relative returns (portfolio returns relative to benchmarks) are a useful measurement to determine the preferability of an investment, as well as its opportunity cost.
2. Benchmarks and the Calculation of Relative Returns
    a. Benchmarks
        i. Benchmarks are used to provide relative measurement of investment performance and composition. This can give an investor an idea of the performance and risk they can expect.
        ii. Benchmarks should meet the following criteria to be feasible:
            1. Investability (the assets that comprise the benchmark should be available to invest in by manager)
            2. Compatibility (the benchmark and its components should be compatible with an investor's goals and needs)
            3. Clarity (rules governing construction, recomposition, weighting, and how performance is to be measured should all be clear)
            4. Pre-Specification (the benchmark should be specified before an investment is made)
    b. Indices
        i. Indices are another metric that can be useful for measuring relative performance. There are indices for exchanges, economies, sectors, security types, currencies, and more.
    c. Relative Returns
        i. Benchmarks and indices allow for the performance of investments and their managers to be measured relatively, and they also provide performance targets to meet.
3. Tracking Error and Information Ratio
    a. Tracking Error: the difference between an investment's performance and the benchmark or index it is tracking. This is measured by calculating the standard deviation of the difference between the investment and its benchmark/index.
    b. Information Ratio = (Portfolio Performance - Benchmark/Index Performance) / Tracking Error

4. Skill versus Luck
    a. Alpha: skill.
    b. The three components of returns are:
        i. Market Return: refers to the part of returns that are a result of market conditions and not a manager's actions.
        ii. Luck: refers to the part of returns that are a result of fluctuations in asset prices due to unforeseen events.
        iii. Skill: refers to the part of returns that are a result of an investor's skill, alpha can be measured as returns above a benchmark.
    c. Distinguishing Between Sources of Return
        i. There are models and methods that can be used to measure each of these three components, called factor models. One such model/method is CAPM, which contains beta. Systematic risk is the risk that all investments face, and it cannot be diversified away.

5. Attribute Performance
    a. Performance of a portfolio can be determined by:
        i. Asset Allocation
        ii. Sector Selection
        iii. Stock Selection
        iv. Currency Exposure
    b. Performance Attribution is the process of determining how each of the factors listed above determined performance.