Different approaches to investment

Active versus Passive Management

Passive versus Active Management

Investors have two main investment strategies that can be used to generate a return on their investment accounts: active portfolio management and passive portfolio management. These approaches differ in how the account manager utilizes investments held in the portfolio over time. Active portfolio management focuses on outperforming the market compared to a specific benchmark, while passive portfolio management aims to mimic the investment holdings of a particular index.

- Active management is when managers actively pick investments in an effort to outperform some benchmark, usually a market index.
- Passive management is when a fund manager attempts to mimic some benchmark, replicating its holdings and, hopefully, performance.
- Active management funds tend to have high fees, and recent research has called into question their ability to outperform the market with any consistency.

Active Management

The objective of a portfolio manager in an actively managed fund is to beat the market, he or she must take on additional market risk to obtain the returns necessary to achieve this end. Indexing eliminates this, as there is no risk of human error in terms of stock selection. Index funds are also traded less frequently, which means that they incur lower expense ratios and are more tax-efficient than actively managed funds.

Active management traditionally charges high fees, and recent research has cast doubts on managers' ability to consistently outperform the market.

Passive Management

Passive Portfolio Management
Passive management, also referred to as index fund management, involves the creation of a portfolio intended to track the returns of a particular market index or benchmark as closely as possible. Managers select stocks and other securities listed on an index and apply the same weighting. The purpose of passive portfolio management is to generate a return that is the same as the chosen index instead of outperforming it.

A passive strategy does not have a management team making investment decisions and can be structured as an exchange-traded fund (ETF), a mutual fund, or a unit investment trust. Index funds are branded as passively managed because each has a portfolio manager replicating the index, rather than trading securities based on his or her knowledge of the risk and reward characteristics of various securities. Because this investment strategy is not proactive, the management fees assessed on passive portfolios or funds are often far lower than active management strategies.

Market Neutral Strategies

Equity Market Neutral Strategy

Key Objective:

Equity Market Neutral is generally designed to provide a source of returns that is lowly correlated to broad equity markets

Traditional long-only active equity portfolios provide two sources of return for investors: one from passive exposure to the market and the other generated by manager skill by overweighting outperforming stocks and underweighting underperforming stocks. Most of the returns generated in traditional long-only portfolios are attributable to the passive market component. In equity market neutral portfolios, however, passive market exposure is effectively hedged out, allowing for

Market Neutral Strategies (2)

Equity market neutral managers buy stocks they expect to outperform and sell stocks they expect to underperform, but they don’t stop there. By balancing the amount of stocks that they buy and sell, the manager is able to create a portfolio that has zero net exposure to the market itself. The result is a strategy with a return stream that is unaffected as equity markets move up or down. In other words, the strategy’s return is lowly correlated to equity markets.

CAPM (Capital Asset Pricing Model)

Notations:

E(Ri) - expected return of stock “i”

E(Rm) - expected return of the market return

Bi - “beta” of stock “i”

Rf - risk free rate

$E(Ri) = Rf + Bi * (E(Rm) - Rf) + E(Alpha)$

$Bi = Cov(Ri, Rm) / Var(Rm)$

1. Religious motivation for “passive” investment E(Alpha) = 0
2. Tools to construct “market neutral” portfolios for “active” investment, search for E(Alpha) != 0

Diversification

N - number of independent bets

Volatility —-> Volatility/Sqrt(N)

N - correlated bets with the same cross correlation “rho”

Volatility ——> Volatility * Sqrt((1+rho * (N-1))/N) —-> Volatility * Sqrt(rho) (N - large)

Diversification (2)

Perfectly diversified portfolio w[i] = C , “i” - stock label , i = 1, …, N

Measuring diversification for arbitrary portfolio using IPR (Inverse Participation Ratio)

IPR = (Sum(w[i]^2)^2 / Sum(w[i]^4)

Case 1) w[i] = C, IPR = N (Perfect diversification)

Case 2) w[1] = C, w[i] = 0 (i>1), IPR = 1 (Concentrated portfolio)

Long Only (Passive strategies)

Index tracking

ETFS - exchange trading funds

ADR’s

Details.

Arbitrage

Arbitrage refers to a risk-free investment strategy that exploits inefficiencies in the market.

Arbitrage refers to the practice of simultaneously buying and selling an investment in order to profit from a difference in price. Essentially, arbitrage can exist because of inefficiencies in the market, and if an arbitrage is found, it can be a risk-free way to earn a profit.

Basic arbitrage

The basic concept of arbitrage is to buy an asset while simultaneously selling it (or a substantially identical asset) at a higher price, profiting from the difference. Since the transactions occur at the same time, there is no holding period, hence this is a risk-free profit strategy. While the term can be used to describe this type of transaction involving any asset type, it generally refers to stocks, bonds, currencies, and other financial instruments.

Arbitrage (2)

There are three basic conditions under which arbitrage is possible:

- The same asset trades for different prices in different markets. Consider the following example: A certain stock is trading on the NASDAQ for $50 per share, and is trading on a foreign market for $50.25 per share. By simultaneously buying the stock for the lower price and selling it for the higher one, a trader can make a quick, risk-free profit of $0.25 per share. Thanks to technology and high-frequency trading systems, arbitrage examples like this don't typically occur in the real world, and if they do, they last for a second or two.
- Assets with the same cash flows trade for different prices. For example, if a two bonds sell for $990 and $1,000, but both pay $50 per year in interest, there is an arbitrage opportunity to buy the cheaper one and sell the more expensive one.
- Assets with a known future price trade at a discount today, in relation to the risk-free interest rate. Let's say that company X is to be acquired for $100 per share in one month, and the deal has been approved by regulators and both companies' boards. However, the stock trades for $98 per share. By purchasing shares and holding until the acquisition is finalized, a risk-free $2 per share profit can be made.

Arbitrage (3)

In practice

In the real world, completely risk-free arbitrage opportunities generally don't exist. Rather, the goal of arbitrage in practice is to stack the odds in your favor. Think of a casino -- while there is an inherent risk that the casino could lose money, the odds are in its favor, and over time there is an expectation of profit.

In the example of a pending merger discussed earlier, there is always a chance the deal will fall apart up until it's actually finalized -- however, the chance is usually extremely small, especially after it's been approved.

Index / ETF / ADR arbitrage

High frequency trading

ETF - equivalent to a basket of stocks + cash (usually accumulated from dividends)

ETF - can be traded directly at exchanges as a regular stock (no uptick rule for short sell). “Fair price of ETF” = cash + Sum (w[i] * StockPrice[i]), where w[i] is a weight of stock “i” in a basket

AP - authorized participants / Creation redemption (see pdf for details)

The logic of trading applications

High Frequency ETF arbitrage

For simplicity assume we have an ETF with single stock component:

Fair Price of Etf = S, where S - stock price.

Notations:

Sa - best stock ask price, Ea - best etf ask price

Sb - best stock bid price, Eb - best etf bid price

Fa = Sa (fair ask price for an ETF)

Fb = Sb (fair bid price for an ETF)

High frequency ETF arbitrage (2)

In the absence of arbitrage opportunities we will have the following conditions:

$Sa > Sb, Sb = Fb = Eb, Sa = Fa = Ea$

Assume we managed to perform the following transactions:

1. Buy “n” shares of ETF at price $Eb < Fb = Sb$
2. Sell “n” shares of stock at price Sb

Unrealized PnL of this (market neutral) portfolio (“marked to market”) is:

$n*(E - Eb) - n* (S - Sb)$, where E - last transaction price for ETF, S - last transaction price for stock

Unrealized Pnl marked to Fair price:

$n* (S - Eb) - n* (S - Sb) = n * (Sb - Eb) > 0$

High frequency ETF arbitrage (3)

Redeem “n” shares of ETF via authorized participant.

Replace in your portfolio “n” shares of ETF with “n” shares of stock

Note we are long “n” - shares of ETF and short “n” shares of stock

“Redemption” can be viewed as the following 2 trades:

Sell “n” shares of ETF @ price = “S”, realized PnL = n * (S - Eb)

Buy (to cover) “n” shares of stock @ price = “S”, realized PnL = n * (Sb - S)

Total Realized Pnl = n * (S - Eb) + n * (Sb - S) = n * (Sb - Eb)

Different players in the market

- Buy side (hedge funds, mutual funds, prop trading firms)
- Sell side (banks, broker dealers)
- Dumb money
- Informed traders
- Market makers