LM01 Index-Based Equity Strategies

Instructor's Note: The terms 'index-based investing' and 'passive investing' have been used interchangeably in this learning module.

Factor-based strategies versus market-capitalization weighting

In **market-capitalization-weighted** indexing, we create portfolios with the same weights of constituent securities as the benchmark index. The drawback of this method is that overpriced securities are over-weighted and underpriced securities are under-weighted.

In **factor-based strategies,** we try to replicate the performance of a benchmark by creating a portfolio that has the same exposure to risk-factors as the benchmark. Some risk factors include growth, value, size, yield, momentum, quality, volatility etc.

- With factor-based strategies, investors can seek exposure to particular factors and/or overweight or underweight certain factors.
- To implement this strategy, decisions need to be made on the timing and degree of factor exposure.
- The risk associated with such strategies is that the chosen factor may become out of favor.
- In general, factor-based strategies have higher management fees as compared to traditional market-cap based strategies.

The three broad categories of factor-based strategies are:

1. **Return oriented**
   - Dividend yield strategy: involves selecting stocks that have a relatively high dividend yield and which is expected to increase.
   - Momentum strategy: involves selecting stocks that are outperforming other stocks in a given period.
   - Fundamentally weighted strategies: involves using a company's fundamentals—book value, cash flow, revenue, sales, dividends, and employee count—as a basis for weighting each company.
2. **Risk oriented**
   - These strategies seek to reduce risk. Several measures such as volatility, and downside volatility can be used to measure risk.
   - An easy way to implement this strategy is to build a portfolio with weights inversely related to the constituent's volatility. High volatility stocks will have a low weight in the portfolio.
3. **Diversification oriented**
   - A simple method is to create an equal-weighted portfolio, where each stock has the same weight.
   - A sophisticated method is to determine weights (by looking at past volatility

and correlations) to maximize future diversification.

Different approaches to passive equity investing

The three main approaches to passive equity investing are:

- pooled investments (e.g., mutual funds and ETFs),
- derivatives-based approaches (using options, futures, and swaps) and
- separately managed equity index-based portfolios (a do-it-yourself method).

Pooled investments

The two major types of pooled investments are open-end mutual funds and exchange-traded funds. As with any investment decision, the first step, while selecting pooled investments, is to carry out a needs-based analysis and understand the investor's return and risk objectives as well as investment constraints. Once the need has been identified, an investment can be made in an appropriate fund or a set of funds.

Mutual funds

Mutual funds shares can be purchased through:

- Fund manager
- Individual financial advisor
- Fund marketplace

A major benefit of investing in mutual funds is that they are convenient and cost-effective. This convenience and cost effectiveness are achieved by outsourcing a lot of work to the fund manager.

Some constraints associated with open-ended mutual funds are:

- Shares can only be bought or sold based on closing prices. They are not traded throughout the day.
- Shares cannot be shorted.
- Margin purchases are not allowed.

Exchange-Traded Funds (ETFs)

Similar to open-ended funds, ETFs are also a convenient and cost-effective option for investors.

However, ETFs have several advantages over open-end funds that have made them popular over the last couple of decades. Some of the advantages are:

- ETFs trade a lot like regular shares, they can be bought or sold during the trading day.
- Margin borrowing and short positions are allowed.
- They have a slightly lower expense ratio as compared to mutual funds.
- ETFs have a unique structure that leads to tax efficiency.

- Compared to mutual funds, ETFs track many more equity indexes.

Some disadvantages associated with ETFs are:

- Though ETFs track many more indexes as compared to mutual funds, there are still several indexes that are not tracked by an ETF.
- ETFs are subject to the bid-ask spread.
- They expose an investor to liquidity risk.
- Commission costs/ brokerage fees need to be paid while buying or selling ETFs.

Over time factor-based ETFs have also become popular. They track one or more factors such as size, value, momentum, quality, volatility, etc.

Derivatives-based approaches

Derivatives are typically used to adjust pre-existing portfolios and move them closer to their benchmarks. These derivative positions are called 'overlays'. There are three types of overlays:

1. Completion overlay: Consider a stock portfolio that is tracking the S&P 500. This portfolio has built up surplus cash because of dividends from the underlying stocks. The surplus cash causes the portfolio beta to be less than that of the S&P 500. Using derivatives, we can restore the overall portfolio beta to that of the S&P 500.
2. Rebalancing overlay: Consider a mixed portfolio that was constructed using 60% stocks and 40% bonds. Stocks performed well over time, and the portfolio weights are now 70% stocks and 30% bonds. Using derivatives, we can rebalance the portfolio towards the original target weights.
3. Currency overlay: Consider a US-based investor who has bought shares in Europe. He has exposure to the EUR/USD exchange rate. Using derivatives, the investor can hedge this exposure.

Derivatives-based approaches offer several advantages:

- They are cost-effective, especially in the short-term.
- They are easy to implement.
- They provide significant leverage. A substantial exposure can be obtained with a relatively small amount of investment.

However, derivatives also have several disadvantages:

- Derivatives are not available in all markets. Also, some derivative products like swaps are not accessible to small individual investors.
- There may be restrictions on using derivatives.
- OTC derivatives such as swaps, expose an investor to counterparty risk.
- Most derivatives tend to have short maturities. A long-term derivatives-based strategy requires constant rolling over positions.

Equity index futures

- Equity index futures allow us to increase/decrease the exposure to an index portfolio through a single transaction.
- They typically have a multiplier and initial and maintenance margin requirements.
- Some futures contracts may be more liquid than the underlying securities.
- It is easy to take short positions in the index futures rather than taking short positions in the underlying securities.
- Several large popular indexes have future contracts. However, many smaller indexes do not have futures contracts.
- If a futures contract does not fully track the underlying benchmark, then we have 'basis risk.'

Equity index swaps

- These are OTC negotiated agreements in which two parties agree to exchange cash flows.
- Like equity index futures, they too can be used to increase or decrease exposure to a benchmark.
- By using equity index swaps, investors can avoid paying taxes on the full equity return amount.
- As compared to equity index futures that are available only for a limited number of equity indexes, a swap can be initiated on virtually any index, as long as there is a willing counterparty.
- However, equity index swaps expose investors to the following risks: counterparty risk, liquidity risk, interest rate risk, and tax policy risk.

Separately managed equity index-based portfolios

For large investors, it can be cost-effective to build their own portfolios.

However, several capabilities and tools are required to build a separately managed portfolio. These include:

- Data subscription
- Trading systems
- Accounting systems
- Good broker relationships
- Compliance tools

Typically, managers buy securities using a 'program trade.' A program trade allows investors to buy and sell several securities simultaneously.

Once a portfolio is created to mimic a benchmark index, the manager must continue to review the holdings frequently.

- If there are any changes in the benchmark index, the manager must make trades to reflect the changes in the portfolio.

- If the underlying stocks pay cash dividends, the manager must reinvest these dividends.

Since the index is priced at the close of business each day, to replicate the index, most trade execution takes place at the close of the business day. 'Market-on-Close' (MOC) orders are used to achieve this objective.

Passive portfolio construction

The three main approaches to constructing passively managed portfolios are full replication, stratified sampling, and optimization.

Full replication:

- In this approach, all securities represented by the index are purchased in weightings that closely match the actual index weightings.
- Some indexes are more conducive to full replication than others.
- Portfolio managers use data from index providers to construct portfolios.
- To execute a set of buy and sell orders, data is imported into a data compiler or an Order Management System (OMS). The OMS should have a pre-trade compliance check feature. This ensures that before a trade is executed, all necessary checks are done to ensure that no rules and regulations are violated.
- Once the portfolio is created, the manager must keep the portfolio in sync with the Index. Dividends received should be reinvested. Any changes to the index should be reflected in the portfolio.
- As the number of securities in a portfolio increases, the tracking error decreases, but the associated trading cost increases.
- It may not always be practical to do full replication, then a more suitable approach known as a stratified sampling approach may be used.

Stratified sampling

- Stratified sampling is used when the index has many constituent securities or when assets under management are low.
- In this approach, we split the population into strata (or sub-groups) and then select samples from each stratum.
- The advantage of stratified sampling is that a limited sample can closely track the index. This keeps trading costs low while also minimizing the tracking error.

Optimization

- In this approach, we try to maximize desirable characteristics or minimize undesirable characteristics subject to one or more constraints.
- The advantages of the optimization approach are:
    - It has a lower tracking error relative to stratified sampling.
    - It explicitly considers correlations among the securities of a portfolio.
- The disadvantages of this approach are:

  - Optimizations need to be run frequently, resulting in adjustments that can increase trading costs.
  - Optimization requires a high level of technical sophistication.

Tracking error management

Tracking error measures the extent to which a portfolio tracks a benchmark.

- It is calculated as the standard deviation of the difference between the portfolio return and its benchmark return.
- Excess return is the difference between the portfolio return and the benchmark return. Tracking error and excess return are separate measures, and they should not be used interchangeably. It is possible to have a high tracking error but a zero excess return. This can happen if the portfolio was initially lagging the index and then subsequently leading the index by the same amount.
- Index fund managers try to maintain a low tracking error and an excess return that is not negative.
- Tracking error varies depending on the manager's approach to tracking the index and data frequency.

The potential causes for tracking error are:

- Fees charged
- Number of securities
- Intra-day trading
- Trading commissions
- Cash holdings

The following approaches can be used to control tracking error:

- Minimize cash held
- Invest at valuations used by index providers
- Maintain a beta of 1 relative to the index.
- Keep risk factor exposures similar to those of the index.

Sources of return and risk in passive equity portfolios

Attribution analysis refers to the analysis of sources of return of the portfolio and the underlying index and identifying the reasons for the differences.

- The sources of return include company-specific, sector, country, currency, etc. For passive managers, the most significant source of return is sector allocation.
- Portfolio managers should understand what factors are driving the returns of the portfolio and the index.

Securities lending: Fund managers can lend shares to short-sellers and other market participants for a fee. This fee can help offset portfolio management costs. The main risks in this strategy are credit risk: the borrower may not return the borrowed securities and

market risk: the value of the collateral may fall.

Investor activism and engagement: Passive fund managers can also actively engage with companies and help improve their governance. This can improve the performance of the company and generate better returns for the fund.