Portfolio Management Pathway

Portfolio Management Pathway Learning Module 1 Index-Based Equity Strategies

LOS: Compare factor-based strategies to market-capitalization-weighted indexing.

LOS: Compare different approaches to index-based equity strategies.

LOS: Compare different approaches to index-based equity investing.

LOS: Compare the full replication, stratified sampling, and optimization approaches for the construction of index-based equity portfolios.

LOS: Discuss potential causes of tracking error and methods to control tracking error for index-based equity portfolios.

LOS: Explain sources of return and risk to an index-based equity portfolio.

Factor-Based Strategies

LOS: Compare factor-based strategies to market-capitalization-weighted indexing.

A **market-capitalization-weighted** index is constructed by summing the market capitalization of each security in the index. The weight of a constituent security in the index is calculated as its market cap divided by the total market cap of the index.

Market-cap weighting is a form of **liquidity weighting** because the largest-cap securities tend to have the highest degree of liquidity. Most market-cap-weighted indexes are **free-float adjusted**.

A **price-weighted** index is constructed by summing the individual stock prices and dividing by the number of stocks in the index. The divisor must be **adjusted to reflect stock splits** and other outstanding share-changing events.

Price-weighted index returns are determined as if an investor holds one share of each constituent security in a portfolio (this tends to be rare in practice).

An **equal-weighted** index is constructed by assigning equal weights to each security, resulting in the **least concentrated index portfolio**, as measured by the Herfindahl-Hirschman Index (HHI). Equal-weighted index returns are determined as if an investor owns identical cash amounts in each constituent security. This weighting scheme requires **periodic rebalancing** because changes in security values move weights away from being equal. In addition, an equal-weighted index **overrepresents small companies**, meaning that there are potential liquidity considerations to replicating the index.

A **traditional indexing** strategy involves tracking the returns of a market-cap-weighted benchmark index. Since market-cap-weighted portfolios are based on the efficient market hypothesis, an indexing strategy is often referred to as **beta exposure**.

In a **passive-factor-based** strategy, an investor seeks exposure to a limited number of risk factors that drive an index's returns (based on their market outlook), leading to overweighting or underweighting of these risk factors (i.e., "**smart beta**" exposure). A passive-factor-based strategy can also incorporate **factor rotation** to make active bets on market conditions.

Examples of the common equity risk factors include:

- **Growth**—Growth stocks generally exhibit high P/E ratios, EPS growth, and price momentum.
- **Value**—Value stocks are generally mature companies with low P/E and P/B ratios and high dividend yields.
- **Size**—Overweighting or underweighting small-, mid-, and large-cap sectors of the market.
- **Yield**—Investors may prefer high-dividend-yielding stocks when interest rates are low.
- **Momentum**—Targeting stocks that have outperformed the market over a specified period.
- **Quality**—Based on earnings quality, dividend growth, cash flow generation, and degree of leverage.
- **Volatility**—Investors generally prefer low volatility to reduce downside risk.

A passive-factor-based strategy can be used as an alternative to, or to complement, a market-cap-weighted indexing strategy. The key considerations when using a passive-factor-based strategy are summarized below:

- Compared to a broad market-cap-weighted strategy, a passive-factor-based strategy tends to **concentrate exposure** to the desired risk factor, with negative consequences if this risk factor underperforms.
- A passive-factor-based strategy aims to outperform the risk/return profile of a market-cap-weighted strategy. Passive-factor-based strategies can be:
    - **Return-oriented**—These include dividend yield, momentum, and fundamentally weighted strategies.
    - **Risk-oriented**—These include volatility weighting and minimum-variance weighting strategies that are intended to either minimize downside volatility or overall portfolio volatility.
    - **Diversification-oriented**—These include equal-weighted and maximum diversification strategies.
- Portfolio managers who implement factor-based strategies tend to use **multiple benchmark indexes** (e.g., a factor-based index and a broad market-cap-weighted index). This may result in a **tracking error** from the client's perspective when returns of a passive-factor-based strategy are compared against the returns of a broad market-cap-weighted index.
- Passive-factor-based strategies are likely to have **higher management fees and trading commissions** than a broad market-cap-weighted indexing strategy, resulting in lower returns after fees, all else being equal.

Other index-weighting schemes do not use market prices but instead use a stock's **fundamental characteristics** such as sales, cash flow, and book value as a basis for weighting each index constituent.

Pooled Investments

LOS: Compare different approaches to index-based equity strategies.

Equity investors can use three different approaches to obtain exposure to a passive investment strategy: pooled investments, derivatives-based portfolios, and direct equity investment.

A market-cap-weighted index exhibits a high degree of stock concentration (or a low effective number of stocks) and may be relatively undiversified. The degree of stock concentration in an index can be measured by its **Herfindahl-Hirschman Index (HHI)**. The HHI is the sum of the squared weight of each index constituent, with weights being expressed as a decimal—for example, a weight of 10% is expressed as 0.1. HHI values can range from $1/n$ for an equal-weighted index (where n is the number of securities in the index) to 1 for a single-security index. The **effective number of stocks**, held in equal weights, that would replicate the degree of concentration of a specific index is calculated as 1/HHI. For example, if the FTSE 100 index has an HHI of 0.05, its degree of concentration is equivalent to 1/0.05 or 20 securities held in equal weights.

The reading covers the use of **open-end mutual funds** and **exchange-traded funds** (ETFs) to implement passive equity investment strategies. **Index mutual funds** are easy to purchase/sell and offer an inexpensive way for investors to track the performance of indexes. ETFs are similar to index funds with the major exception that they are purchased on an exchange, just like stocks. In addition to ease of access and low costs, the managers of index funds and ETFs are responsible for rebalancing, reconstitution, dividend reinvestment, and other portfolio changes that are required to maintain the fund's investment strategy.

The main **advantages** of using ETFs compared to index mutual funds are as follows:

- They are easy to trade (like stocks).
- Investors can buy ETFs using margin borrowing.
- Investors can take a short position in ETFs.
- ETFs track more indexes than index mutual funds.
- ETFs can be more tax-efficient than index mutual funds because of the in-kind redemption process.
- ETFs typically have lower expense ratios than index mutual funds do.

The **disadvantages** of using ETFs compared to index mutual funds include:

- Commission costs when buying/selling ETF shares, which may more than offset the expense ratio advantage of ETFs.
- Market illiquidity when buying/selling ETF shares.

Derivative-Based Approaches and Index-Based Portfolios

LOS: Compare different approaches to index-based equity investing.

Derivatives-based strategies offer passive equity investors benefits such as **low costs**, **ease of implementation**, and **leverage**. However, options expire (unlike stocks) and futures and swap contracts may need to be rolled over to match an investor's time horizon. Other disadvantages include **counterparty default risk** for derivatives that are not cleared through a central clearing house (or central counterparty) and relative **lack of access to derivatives markets** for small investors.

Minimum-variance investing requires a mean-variance optimizer to determine security weights that minimize portfolio volatility based on historical returns.

Maximum diversification strategies define a diversification ratio as the ratio of the weighted average volatilities divided by overall portfolio volatility. This ratio is used by maximum diversification strategies to determine security weights that maximize future diversification based on historical returns.

Passive equity investors tend to use derivatives-based strategies to **align an existing stock portfolio more closely to its stated objectives** rather than to gain long-term exposure to a specific index. Derivatives-based overlay strategies include:

- **Completion overlays**—Used to restore the portfolio's beta (which has drifted over time) to its target beta.
- **Rebalancing overlays**—Used to buy/sell securities synthetically to achieve rebalancing objectives.
- **Currency overlays**—Used to hedge the returns of foreign currency stocks back into the investor's domestic currency.

In addition, equity index derivatives, such as **equity index futures** contracts, offer passive investors the following benefits compared to cash-based approaches:

- They increase or reduce exposure to the index-based portfolio in a **single transaction**.
- They implement **tactical** portfolio exposure decisions more efficiently.
- **There is a greater liquidity** in derivatives markets.

Open-end mutual funds must sell portfolio securities to fund large redemptions. The sale of securities by the fund manager causes taxable gains to be realized within the fund structure. In contrast, ETFs use an **in-kind redemption** process, meaning that when shares in an ETF are redeemed, they are exchanged for a basket of underlying securities that can then be sold in the market. The in-kind redemption process is not a taxable event within the ETF structure, meaning that the tax impact on the end investor is less than that of an equivalent mutual fund redemption.

However, **longer-term strategic decisions should generally be implemented using cash-based approaches** that do not require expiring derivatives positions to be rolled over. Cash-based approaches are also appropriate when there are no index futures contracts that meet a passive investor's objectives or when there are regulatory restrictions (or constraints in an investor's IPS) related to the use of derivatives.

Equity index futures contracts also expose investors to **basis risk** due to futures prices not being perfectly aligned with spot prices. As a result, passive investors may use **equity index swaps** to obtain index exposure synthetically. A typical equity index swap may involve an agreement by two parties to exchange the return on a specified equity index for a floating interest rate.

Some of the advantages of using equity index swaps are:

- It is theoretically possible to initiate an equity index swap on any equity index, giving investors more flexibility compared to using equity index futures contracts.
- Equity index swaps are a low-cost alternative to cash-based approaches that require purchasing all the index constituents.
- They can be used to leverage or hedge a position.

The main disadvantages of using equity index swaps include:

- **Counterparty default risk**—The swap counterparties are exposed to counterparty default risk if the swap is not cleared centrally.
- **Liquidity risk**—Customized swap transactions are illiquid, over-the-counter (OTC) transactions.
- **Interest rate risk**—This is borne by the counterparty paying the floating interest rate in exchange for receiving the index return.
- **Tax policy risk**—Tax laws giving favorable tax treatment to equity index swaps compared to owning a cash-based portfolio may change in the future.

An example of **leverage with derivatives** is when an investor gains market exposure using equity index futures contracts. The investor's exposure is much larger than the margin paid to open the futures contracts.

Separately Managed Equity and Index-Based Portfolios

Investors who wish to construct an index-based portfolio as a **separately managed portfolio** must possess the relevant index construction, trading, accounting, and monitoring tools for the initial construction and subsequent reconstitution/rebalancing of the portfolio in order to minimize tracking error against the benchmark index. **Program trading** is used in the initial construction of the index-based portfolio. The commission charged by brokers is a key consideration due to the large number of trades required for initial construction and ongoing maintenance of the portfolio.

Program trading is used to buy or sell a large number of stocks at the same time. Index-based program trading typically takes place at the end of the day in order to mimic an index that is priced at the end of the day.

Portfolio Construction

LOS: Compare the full replication, stratified sampling, and optimization approaches for the construction of passively managed equity portfolios.

The main approaches to constructing an index-based portfolio using direct equity investment are full replication, stratified sampling, and optimization.

Full Replication

In full replication, the investor purchases every security contained in the benchmark index in the **exact same proportion** as the index. Full replication should result in **negligible tracking error** but requires a large enough mandate size and liquid index constituents. Full replication may also not be feasible if the index has an extraordinarily large number of constituent securities.

Full replication becomes **more expensive** when the securities contained in an index become traded in illiquid markets. This affects the decision to choose **full replication or a sampling approach**. Initially, as the number of securities in the index-based portfolio increases, its tracking error decreases as its constituents get closer to replicating those of the benchmark index. As smaller and more illiquid stocks are subsequently added, trading costs begin to negatively affect portfolio performance and tracking effectiveness. As the most illiquid stocks are added to the index-based portfolio, the impact of trading costs causes the tracking error of the index-based portfolio to increase. This results in a U-shaped relationship between the tracking error of the index-based portfolio and the number of securities held.

Stratified Sampling

Stratified sampling is used when the benchmark index contains a large number of constituents or when the mandate size is relatively small. The investor carves the index into various strata or cells according to the characteristics of the securities in the index (e.g., industries or equity styles), and **weighs each cell in line with index weightings**. Each cell will typically include the most liquid securities that are representative of the cell's description. This enables a stratified sampling approach to closely track index performance while keeping trading costs down. Indexes can also be stratified using multiple dimensions—for example, a global equity index can be stratified by country and then by industry within each country—to improve tracking effectiveness.

Optimization

Optimization approaches can be used in conjunction with **stratified sampling or on a stand-alone basis** to construct index-based portfolios that minimize tracking error. Additional constraints, such as the maximum number of securities to be included in the portfolio and the total risk of the portfolio, can also be added to the optimization model. When an optimization model is run without constraints, it uses security characteristics, such as beta and size, to construct the index-based portfolio to mimic the performance of the benchmark index.

Optimization approaches enable investors to construct index-based portfolios with **lower tracking error** compared to only using stratified sampling. The optimization model also explicitly considers the **historical**

correlations between securities in the portfolio. However, these historical relationships may change over time, meaning that the investor may need to run the optimization model frequently and adjust the index-based portfolio accordingly.

Example 1: Passive equity portfolio construction

A pension fund that invests mostly in large- and small-cap stocks to fund the retirement needs of former high-school teachers decides to pursue passive investing for the portion of its total portfolio that consists of equity securities. Wayne Goose, CFA, must decide between fully replicating an index and an optimization strategy that would allow for sampling.

Goose, the pension fund manager, decides that the Pebble Global Index containing 6,000 equity securities is the relevant index for the pension fund.

A. Identify the construction approach that Goose should use.

B. Justify your answer with *two* reasons.

Solution:

A. Goose should use the optimization strategy.

B. Any two of the following reasons are acceptable:

- With 6,000 securities, full replication would be virtually impossible.
- The inclusion of small-cap stocks implies wide differences in trading costs and liquidity, making full replication even more costly.
- Optimization will allow Goose to minimize the tracking error of the passive portfolio.

Blended Approach

An index-based portfolio can also be constructed using a combination of the above approaches. In the example, it is likely that the largest 1,000 securities of the index are highly liquid. Investors can use **full replication for highly liquid securities** when constructing the index-based portfolio, with **stratified sampling or optimization** being used for the remaining securities in the benchmark index. This blended approach enables the index-based portfolio to track the benchmark index closely and in a cost-efficient manner.

Tracking Error Management

LOS: Discuss potential causes of tracking error and methods to control tracking error for passively managed equity portfolios.

Tracking Error and Excess Return

Excess return and tracking error are measures that can be used to evaluate the performance of a passively managed equity portfolio. **Excess return** for a portfolio *p* is the difference between the return on the portfolio (R_p) and the return on the benchmark index (R_b).

Excess return for portfolio

$p = R_p - R_b$

The index-based portfolio's excess return can be positive or negative and indicates how the portfolio has performed relative to its benchmark index.

A portfolio's **tracking error** is defined as the standard deviation of its excess return.

Passive managers aim to **minimize tracking error** to demonstrate that their index-based portfolios closely replicate the return of the benchmark index. They will also want to **avoid negative excess returns** so as not to underperform the benchmark index.

Example 2: Excess return and tracking error

Table 1 lists performance measures related to three passive equity portfolios that are being used to track a benchmark index consisting of 100 securities.

Table 1: Performance measures

Portfolio	Holdings	Three-Year Annualized Excess Return	Three-Year Annualized Tracking Error	Annual Management Fee (bps)
A	75	+0.98%	1.81%	10
B	98	+0.22%	1.29%	32
C	103	–0.53%	1.54%	39

Explain whether the portfolios are adopting a replicating or sampling approach.

Solution:

Portfolios B and C are most likely replicating the benchmark index, as they hold close to 100 securities. Portfolio B has the lowest tracking error and positive excess return, while Portfolio C's excess return is negative, indicating underperformance relative to the benchmark index. Portfolio C also holds more securities than the benchmark index, most likely due to the use of buffering in portfolio reconstitution. Portfolio A, with 75% of the securities in the index, is most likely using a sampling approach.

Potential Causes of Tracking Error and Excess Return

Tracking error in an index-based portfolio can be attributed to a number of factors:

- **Management fees**—The fees charged by the portfolio manager will result in lower excess returns and higher tracking error.
- **Use of sampling**—When an index comprises a large number of constituent securities or contains illiquid securities, sampling (rather than full replication) is normally used to construct the index-based portfolio, typically resulting in higher tracking error.
- **Intraday trading of index constituents**—Because an index is priced at the end of the day, any securities that are bought or sold for an index-based portfolio at a different price during the day will contribute to tracking error.

- **Broker commissions**—These costs affect tracking error in the same way as management fees.
- **Cash drag**—Because an equity index does not have any cash allocation, the cash balance of an index-based portfolio will dilute returns relative to the benchmark index and contribute to tracking error (note that the effect of cash drag on portfolio returns is negative in a bull market and positive in a bear market).

Controlling Tracking Error

Methods to control tracking error involve a trade-off between the benefits and costs of fully replicating the returns of the benchmark index. These include:

- **Minimizing trading costs** (including broker commissions) that negatively affect the performance of an index-based portfolio.
- **Minimizing cash drag** by:
    - Investing cash flows from investors and dividends from stocks in the index-based portfolio at the same prices used for index valuation; or
    - Using derivatives such as equity index futures contracts to equitize a cash position.

Sources of Return and Risk in Index-Based Equity Strategies

LOS: Explain sources of return and risk to a passively managed equity portfolio.

Attribution Analysis

Attribution analysis enables passive investors to understand the sources of return for their index-based portfolios and how these returns compare to those of the benchmark index. This *ex post* analysis provides a sector-level breakdown of the over- or underperformance of the index-based portfolio relative to the benchmark index over a given period and can be used to develop return expectations for the portfolio in different market conditions.

Example 3: Sector attribution analysis

See Table 2, which illustrates the attribution analysis for selected sectors of an index-based portfolio. Assume that the return on the index-based portfolio was 3.94% whereas the benchmark index posted a return of 3.90% over the same period.

Table 2: Attribution analysis for selected sectors of an index-based portfolio

	Portfolio			Benchmark		
Sector	**Sector Return (A)**	**Sector Weight (B)**	**Contribution to Return (C) = (A) × (B)**	**Sector Weight (D)**	**Contribution to Return (E) = (A) × (D)**	**Difference (F) = (C) − (E)**
Consumer Goods	4.45%	20.8%	0.93%	20.5%	0.91%	0.02%
Financials	–3.50%	17.5%	–0.61%	17.9%	–0.63%	0.02%
Oil and Gas	4.50%	14.0%	0.63%	14.2%	0.64%	–0.01%
Healthcare	8.75%	13.4%	1.17%	13.3%	1.16%	0.01%
Consumer Services	3.90%	9.8%	0.38%	10.0%	0.39%	–0.01%
Telecoms	9.25%	6.9%	0.64%	6.8%	0.63%	0.01%

Column A – total return for each sector.

Column B – portfolio's sector weights.

Column C – contribution of each sector to total portfolio return, calculated as sector return (column A) multiplied by sector weight in the portfolio (column B). If all the sectors had been listed, the sum of the contribution to returns of all the sectors would have equaled the total portfolio return.

Column D – benchmark index's sector weights.

Column E – contribution of each sector to the total return of the benchmark, calculated as sector return (column A) multiplied by sector weight in the benchmark (column D). If all the sectors had been listed, the sum of the contribution to returns of all the sectors would have equaled the total return of the benchmark.

Column F – difference in the contribution to returns between the portfolio and the benchmark by sector (difference between column C and E).

Based on this table, which sector/s made the biggest contribution to the outperformance of the portfolio relative to the benchmark, assuming that the difference in contribution to returns between the portfolio and the benchmark for the remaining sectors was negligible?

Solution:

The difference between the return on the portfolio (3.94%) and the return on the benchmark (3.90%) is primarily explained by the difference in the contribution to returns for the Consumer Goods and Financials sectors (0.02% difference in contribution to returns for each sector).

Note that although the Financials sector posted a negative return, this sector was underweighted relative to the benchmark, producing a positive difference in the contribution to returns.

Securities Lending

Index-based portfolio managers can lend the securities in their portfolios to short sellers in order to **generate income** to **offset portfolio management expenses** and **improve portfolio returns**. In addition to paying a **borrowing fee** for the securities, borrowers must provide collateral in the form of cash or securities for the borrowed securities and return any dividends received on these securities to the lender. The lender is also allowed to sell the loaned securities at any time, in which case the borrower will need to return the securities to the lender in time for settlement purposes.

The risks of securities lending include:

- **Credit risk**—This is dependent on the credit quality of the borrower.
- **Market risk**—The value of the collateral, when posted in the form of securities, may fall over time.
- **Liquidity risk**—The liquidity of the collateral, when posted in the form of securities, should be considered by the lender.
- **Operational risk**—This arises from using lending agents to implement the securities lending transaction.
- **Cash collateral investment risk**—This arises when the lender decides to invest cash collateral in risky securities to boost returns.

Investor Activism and Engagement by Index-Based Fund Managers

As large shareholders in the securities of index constituents, passive equity portfolio managers can use **voting** and **engagement with company management** to improve corporate governance practices in these companies with the **ultimate aim of increasing returns**. However, while some companies may look at the permanence of shareholdings by index-based portfolio managers as motivation to engage with them on a range of corporate governance issues, other companies may view their tracking mandate as a selling constraint and consequently give less consideration to the activist activities of these portfolio managers.

Portfolio Management Pathway
Learning Module 2
Active Equity Investing: Strategies

LOS: Compare fundamental and quantitative approaches to active management.

LOS: Analyze bottom-up active strategies, including their rationale and associated processes.

LOS: Analyze top-down active strategies, including their rationale and associated processes.

LOS: Analyze factor-based active strategies, including their rationale and associated processes.

LOS: Analyze activist strategies, including their rationale and associated processes.

LOS: Describe active strategies based on statistical arbitrage and market microstructure.

LOS: Describe how fundamental active investment strategies are created.

LOS: Describe how quantitative active investment strategies are created.

LOS: Discuss equity investment style classifications.

Approaches to Active Management

LOS: Compare fundamental and quantitative approaches to active management.

LOS: Analyze bottom-up active strategies, including their rationale and associated processes.

LOS: Analyze top-down active strategies, including their rationale and associated processes.

Fundamental approaches use human judgment to make investment decisions (**discretionary**), whereas quantitative approaches attempt to take human judgment out of the process with a rules-based system (**systematic**).

Fundamental approaches may, however, use quantitative tools, and quantitative approaches may use judgment in deciding which variables are relevant as well as in deciding how the model should be constructed. Quantitative analysts may also use company fundamentals in their models.

Fundamental approaches require analysts to possess the skill, experience, and judgment to develop a conviction on economic, sector, and industry trends as well as to develop a forecast for companies within an industry. Managers then construct portfolios, within acceptable risk parameters, based on analyst recommendations and their own judgment.

Quantitative approaches require a superior statistical modeling ability to apply relevant variables over many securities and then to determine the relationships among variables that lead to return relative to the portfolio's benchmark. Analysts prepare a forecast of these rewarded variables, and the model in turn develops a return forecast for the individual security's performance. Quantitative managers then use optimizers to combine individual securities in a way that maximizes return per unit of risk in the portfolio.

Hybrid approaches may use both fundamental and quantitative elements.

Differences in the Information Used

Fundamental analysts may approach selection via the following approaches:

- Top down—Research focuses on how economic variables such as GDP growth, money supply, and expected inflation will affect various countries, sectors, or industries. The analyst then chooses companies expected to outperform as the result of specific characteristics such as superior management and product pipeline.
- Bottom up—Research focuses on peer-relative valuation, profitability, leverage, and other historical information, as well as impressions from company visits and statements from management. These are considered in absolute as well as historical terms. Analysts also consider footnotes to financial statements, accounting policies, and environmental, social, and governance (ESG) philosophy and performance.

Fundamental analysis taxes human capability, so analysts may specialize in a specific industry rather than attempt to personally understand every security.

Quantitative analysts often use much of the same data but process it systematically rather than developing personal judgments about specific firms. Judgment may be used to build a quantitative model, but quantitative analysis usually excludes nonquantifiable variables from the forecasting model.

Differences in the Focus of the Analysis

Fundamental investors tend to focus on a specific group of stocks in which they believe they can earn additional return through allocation or selection advantage. Because of the limited universe, fundamental investors tend to take larger positions in fewer securities.

Quantitative investors focus on specific factors rewarded with return by the market as applied across a broad universe of securities. They spread these factor bets across a larger number of securities than would fundamental investors.

Differences in Orientation to the Data

Fundamental investors attempt to forecast future performance of the company behind the security whereas quantitative investors attempt to use historical data for insights to current factors rewarded by the market.

Quantitative research avoids look-ahead bias and survivorship bias by using historical data on both ongoing concerns and former businesses that were available to the market at a specific recording period. For example, fraudulent data reported by a company should still be used if the market was not aware of the fraud at the time, because that historical data point contains relevant information on how the market rewarded that specific data.

In contrast, fundamental approaches may use a variety of techniques to normalize company results against fraudulent historical data.

Differences in Portfolio Construction

Fundamental investors develop a list of “high-conviction” stocks after extensive analysis of their target universe. The following risks apply to this type of analysis:

- Inaccurate forecast of business performance
- Inaccurate fair value assessment
- Market misperceptions of correct analyst assessments

Portfolio managers construct portfolios from securities selected based on the strength of the analyst’s convictions about these judgments and within the investor’s investment policy statement (IPS) risk parameters. The risks are at the **security level**, so managers monitor and rebalance the portfolio more often as the correctness of their convictions becomes apparent.

In contrast, quantitative models run the risk that factor returns will differ from the model. The risks are at the **portfolio level**, so managers monitor and rebalance the portfolio periodically (e.g., quarterly) as new data becomes available. The quantitative algorithm then adds or deletes positions to reoptimize the risk-reward opportunity.

Types of Active Management Strategies

Bottom-Up Strategies

LOS: Analyze bottom-up active strategies, including their rationale and associated processes.

Fundamental approaches often focus on company-specific information such as:

- Competitive advantage
- Business model and brand strength
- Management strength and corporate governance

These factors may be compared across all companies in a bottom-up approach, or within a sector in a top-down approach.

Competitive advantages such as access to natural resources, innovative technology and business processes, barriers to entry, and exclusive distribution arrangements, and so on, are important because they lead to superior return on capital relative to the firm’s peers. Understanding a firm’s prospects in this context leads to better judgments about future performance, especially in value investing scenarios and most especially after earnings disappointments.

A firm’s business model represents the company’s overall strategy for running the business in a way that creates value for a customer and captures that value in the form of revenues and profits (i.e., the firm’s value proposition). Successful business models are scalable; the firm can increase in size up to the limits of its market while retaining profitability at a certain level.

Corporate branding gives a company an identity within a market and represents its value proposition to customers. Sustainable business models typically generate strong brand loyalty among customers and in many cases allow firms to charge a premium for their products.

Management determines the firm's business model and a strategy for implementing the model to achieve shareholder return requirements. Qualitative determinations about a company's management influence analyst expectations for market performance of its shares:

- Competence and long-term strategy and plans
- Minimizing agency problems via aligning management and shareholder interests
- Ability to attract and retain high-quality talent
- Opportunities and threats related to the firm's ESG characteristics

Bottom-up strategies can be classified into value-based or growth-based approaches.

Value-Based Approaches

Value-based methodologies identify and select stocks trading at a significant discount to intrinsic value. Opportunities may arise when market participants engage behavioral biases against a security, including overreacting to adverse news. Various strategies within a value-based approach include:

- Relative value—Shares with low P/E, P/B, or other favorable value metric against the firm's industry or other peer group within an industry.
- High-quality value—Shares with high earnings quality or other redeeming features.
- Deep value—Shares at extreme discounts to their asset value that could be liquidated at a profit if need be or otherwise profitably reorganized, or at discounts resulting from informational inefficiencies arising from lack of general market interest.
- Restructuring/distressed investing—Shares of companies finding it difficult to make short-term liability payments where investors seek control with the goal of restructuring to increase value. More common in a weak economy, this is similar to deep-value investing, although companies do not need to be in distress to be part of deep value.
- Contrarian investing—Shares recently out of favor purchased with the hope of price recovery when the market rediscovers their true value.
- Income investing—Shares with a floor under their value based on relatively high dividend yield and growth potential.
- Special situations—Shares of companies that could spin off divisions or assets gained through a merger.

Growth-Based Approaches

Growth-based approaches seek shares of companies with revenues, earnings, or cash flow expected to grow at higher rates than the market average and are likely to earn higher returns on equity to reinvest in continued growth. This creates earnings momentum, which generally describes earnings that increase at an increasing rate.

Growth at a reasonable price (GARP) strategies combine elements of growth and value. GARP investors seek above-average growth with a price lower than would be suggested by the growth rate. This may include a below-average price-to-earnings growth rate (PEG) while considering expected growth duration and risk.

Top-Down Strategies

LOS: Analyze top-down active strategies, including their rationale and associated processes.

Top-down strategies focus first on macro variables that affect the market. As such, portfolio managers may implement such strategies using ETFs, custom baskets of securities, futures, swaps, and other derivatives.

Country and Geographic Allocation

In addition to looking at relative macro variables, this approach may also analyze volumes of initial and secondary share issuance, share buybacks, and the flows of investment funds. Analysts may also use more of a bottom-up approach that aggregates individual companies to the country or other geographic sector level.

Sector Or Industry Rotation

Sector/industry rotation identifies and invests in potentially outperforming sectors within a country (e.g., locally specific real estate or consumer staples companies) or in potentially outperforming sectors globally (i.e., for globally integrated industries). Sector or industry performance can be determined from the top down or as a bottom-up process via aggregating individual security expectations.

Volatility-Based Strategies

Managers with skill at predicting actual price volatility different from option-implied volatility can successfully trade VIX futures or index swaps, or enter into volatility swaps and variance swaps.

Traders expecting a large market move but not having an opinion on the direction of the move can enter a straddle by buying a call and put with the same strike price and expiration date. Losses occur in the amount of the option premiums if the market remains flat, but gains result when the market moves a significant amount.

Thematic Strategies

Innovative technology, demographic, or political drivers as well as economic cycles can create broad macroeconomic or individual company opportunities for investment. Unless the manager wishes to make only short-term investments, analysts should focus on themes with long-run structural effects.

Factor-Based Strategies

LOS: Analyze factor-based active strategies, including their rationale and associated processes.

In this approach, the analyst determines which characteristics (e.g., size, earnings quality and momentum, relative value, etc.) the markets reward with return and selects securities with those characteristics. Rewarded factors represent the set of characteristics generating superior return.

Style rotation strategies recognize that certain factors receive greater rewards at certain times, and “rotate” or invest into securities with rewarded factors for a specific environment. Although it applies to both approaches, rotation typically applies more to quantitative than fundamental approaches.

Data mining describes a statistical relationship in data that doesn’t make economic sense. Models based on relationships discovered in data mining may pass the backtesting phase but then fail to generate expected returns when employed in an investment setting.

Factor-based portfolios are typically implemented in a hedged portfolio approach, which first ranks individual securities by expected performance given the factor forecast and then groups them according to quintiles or deciles. The manager goes long the expected best-performing quantile and shorts the expected worst-performing quantile.

Shorting may not be possible in some portfolios, the performance of factors may differ between the best-performing and worst-performing quantiles, and concentration tends to occur in specific stocks across managers with this same approach, resulting in different results than anticipated. Worse, portfolio exposure to factors outside the model can result in significantly different price performance than expected and create losses leveraged by the long-short strategy.

Factor-mimicking portfolios (FMPs) are theoretical long-short, dollar-neutral portfolios with exposure to a specific factor only and no exposure to other factors. FMPs are expensive to implement and sometimes cannot be fully implemented due to positions in nearly every security. Managers implement the theory by considering liquidity and short-trading availability of the securities to reduce expenses.

Factor-tilting portfolios, in contrast, are long-only approaches using a form of enhanced indexing in which the manager tracks an index and makes factor-based bets.

Style Factors

Value

Value factors essentially represent any indication that the security's price is less than its intrinsic value. This may take the form of price divided by any fundamental factor (e.g., earnings, book value of equity, sales, etc.) or it may take the reverse form of a fundamental factor divided by price (e.g., dividend yield). High book-to-market ratio may also be used to indicate a value stock.

According to this approach, the value premium compensates investors for assuming risk that the firm will not recover from an adverse position or will deteriorate. Some studies disagree with this reasoning, instead believing that typical investor behavioral biases cause the premium rather than any real relationship to risk.

Price Momentum

The price momentum approach holds that stocks enjoying higher price appreciation during some past period will continue to enjoy price appreciation. At some point, price appreciation will stall and perhaps reverse, although this has been attributed to investor behavioral biases. Losses from price momentum strategies, then, can suffer high losses (i.e., tail risk).

More recent approaches remove the sector exposure component of price appreciation to establish a security's sector-neutralized price momentum factor. Otherwise, managers become exposed to extreme sector risk, especially in long-short strategies where they remain long winning sectors and short losing sectors.

Growth

In this approach, a company's historical and forecast growth factors (revenues, earnings, etc.) indicate likely future outperformance. The period analyzed may be short or long. Asset growth, however, may indicate weaker future performance.

Quality

Although initially focused on the level of accruals in a company's statements, research has shown that stock prices fail to fully reflect information in accruals and that accrual-to-price relationships may be cyclical.

Financial statements may also be analyzed to determine dividend sustainability, management efficiency, capital utilization, profitability, and solvency. Analyst sentiment, especially earnings revisions, may be used to reflect potential earnings quality turning points. Investors now have access to natural language processing (NLP) algorithms that broadly analyze news stories to assess potential quality issues or opportunities rather than relying on analyst sentiment alone.

Unconventional Factors

Alternative data such as satellite images, online mentions, credit card processing information, and other unstructured data sources may be combined with structured data (i.e., earnings reports, etc.) to establish a broader picture of company activities. This "big data" approach can also be applied to supply chain data—for example, to establish a relationship between customer activity and subsequent earnings changes at the target firm.

Activist Strategies

LOS: Analyze activist strategies, including their rationale and associated processes.

Activist strategies involve investors seeking to make strategic, operational, or financial structure changes that they believe will make the firm more profitable, advance an ESG cause, or induce some other change. They often accomplish this by taking positions of less than 10% in an undervalued security and then obtaining a seat on the board of directors.

Popularity of Shareholder Activism

Opponents of activism argue that it distracts management from running the company whereas proponents contend that it improves corporate monitoring and discipline that may be eroded as part of the principal–agent relationship. In any case, activism goes back to the 1960s and 1970s, with assets under management (AUM) growing until the 2007 financial crisis and then recovering.

Hedge funds and private equity firms that enjoy lower regulatory standards often pursue activist agendas. Their performance-based fee structure in addition to a fee for AUM makes it lucrative for such financial participants to pursue activist strategies.

Shareholder structures, regulatory structures, and even cultural norms can influence jurisdictions in which this is practiced and the types of firms that become targets.

Activist Investor Tactics

Activist investors may seek change via:

- Board representation or nominating board members favorable to their cause
- Engaging with management by writing letters, making direct phone calls, private meetings with members of management, and so forth
- Attending the annual general meeting with suggestions of change
- Launching "breach of fiduciary" legal proceedings
- Joining with other shareholders to demand action
- Launching a media campaign to reform management practices

Activist Investor Targets

Activist investor strategies include:

- Financial reforms that better utilize investor capital, change dividends, or reduce the number of shares outstanding (i.e., share buybacks)
- Realigning management compensation with share price performance
- Unlocking value by spinning off divisions or divesting subsidiaries

Target companies typically have slower revenue and earnings growth than the market average, negative price momentum, or corporate governance structures that benefit management at the expense of shareholders. Targets also tend to be smaller listed companies, although larger companies are now becoming targets of investor activism.

Evidence suggests that activist targets have higher financial leverage but enjoy improving fundamentals after an activist event. Activist investors deliver Sharpe ratio results only marginally higher than the S&P 500.

Other Strategies

Statistical Arbitrage and Market Microstructure Strategies

LOS: Describe active strategies based on statistical arbitrage and market microstructure.

Statistical arbitrage, or stat arb, strategies use stock price, dividend, trading volume, and limit book data in traditional technical analysis, time-series analysis and econometric models, and machine learning processes (artificial intelligence or AI).

In a pairs trading strategy, for example, managers use either qualitative or quantitative methods to determine firms with correlation in price movement. The manager shorts the outperforming security with the idea it will return to the correlation with lower price; the manager goes long the underperforming security with the idea it will return to the correlation with higher price. The correlation may break down as the outperforming company developed a new technology that increased sales and market share to the detriment of the underperforming firm. As the underperforming security eventually catches up and the correlation starts to return, the strategy makes a profit to the long position as its price rises and the outperforming security's price decreases with a profit to the short position.

Microstructure-based trades involve exploiting supply and demand imbalances in the NYSE Trade and Quote (TAQ) book or other data sources, observing positions in the limit book, or other anomalies that may be available for only milliseconds.

Event-Driven Strategies

Mergers and acquisitions, restructuring and spinoffs, special dividends and buybacks, and other corporate events can result in temporary mispricing.

Creating a Fundamental Active Investment Strategy

LOS: Describe how fundamental active investment strategies are created.

Portfolio managers employ an active investment strategy to outperform a benchmark on a risk-adjusted basis as described in the IPS. Managers may attempt to outperform the benchmark by using special allocation insights, superior security analysis and selection techniques, or via access to proprietary data.

Regardless of the manager's advantage, the process of creating an active fundamental strategy tends to follow these steps:

1. Define the investment universe and market opportunity within the IPS mandate.
2. Screen the investment universe for likely investment opportunities based on the strategy.
3. Obtain additional information about the output from the initial screen via sector/industry analysis and by analyzing financial reports.
4. Forecast cash flow or earnings for target opportunities.
5. Develop valuations from the forecasts and determine undervalued securities.
6. Construct a risk-optimized portfolio that achieves the strategy.
7. Use the buy–sell discipline to take profits and avoid losses, as well as periodically rebalance the portfolio.