

Level III of the CFA® Exam

Study Notes - Portfolio Management Pathway - Volume 1

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Table of Contents

36 - Index-Based Equity Strategies	3
37 - Active Equity Investing: Strategies	63
38 - Active Equity Investing: Portfolio Construction	161
39 - Liability-Driven and Index-Based Strategies	261

Reading 36: Index-Based Equity Strategies

LOS 36a. Compare factor-based strategies to market-capitalization-weighted indexing

Factor-Based Strategies Explained

Factor-based strategies blend the cost-efficiency of index funds with the potential for higher returns by focusing on specific risk factors. These strategies leverage insights from financial models, such as the Capital Asset Pricing Model (CAPM), and target factors like market risk, company size, book-to-market ratio, profitability, and investment scale.

Often referred to as "smart beta," these strategies have gained popularity for allowing investors to adjust their portfolio's risk exposure based on market predictions. For instance, an investor might increase investments in small-cap stocks (the size factor) anticipating superior performance.

Index-Based Factor Strategies Detailed

Unlike traditional active management, which involves ongoing buying and selling based on market predictions, index-based factor investing focuses on selecting and weighting factors ahead of time. This approach can either replace or augment a conventional market-cap-weighted index portfolio.

While these strategies can concentrate risk in specific factors, potentially leading to periods of underperformance, they also offer the benefit of transparency in their operations, including how factors are chosen and rebalanced.

To mitigate the risks of concentrating on a single factor, investors often turn to multi-factor strategies, such as combining value (stocks undervalued relative to their fundamentals) and momentum (stocks that have shown strong performance trends) factors. This diversification can help manage the risk of factor underperformance.

Risks and Transparency in Index-Based Factor Strategies

One of the key features of index-based factor strategies is their transparency regarding how factors are selected, weighted, and rebalanced. This allows investors to understand and predict the behaviors of their investments more clearly.

However, the simplicity and transparency of these strategies can also lead to ease of replication, potentially causing overcrowding in certain strategies. When too many investors follow the same strategy, it can diminish the advantages that the strategy originally offered.

Despite the risks, the main aim of factor-based strategies is to enhance the risk-return profile compared to traditional market-cap-weighted indexing, by focusing on factors believed to offer superior returns or reduced risk.

Types of Factor-Based Strategies

Factor-based strategies offer a systematic approach to investing that seeks to capture specific risk factors to achieve various investment objectives. These strategies can be broadly categorized into return-oriented, risk-oriented, and diversification-oriented approaches.

Return-Oriented Strategies

Dividend Yield Strategies: Dividend Yield Strategies focus on generating income through investments in companies that have a consistent record of paying and increasing dividends. This approach is based on the belief that companies which regularly increase dividends are financially stable and can provide reliable income streams to investors. The strategy appeals to investors looking for steady income, especially in low interest rate environments where traditional fixed income investments offer lower returns.

Momentum Strategies: Momentum Strategies capitalize on the tendency of securities to continue their existing trend over time. This strategy is predicated on the observation that assets which have performed well in the recent past (relative to peers) tend to continue performing well

in the near term. Momentum strategies are particularly favored by investors looking to capitalize on trends and the persistence of asset performance.

Fundamentally Weighted Strategies: Fundamentally Weighted Strategies diverge from traditional indexing methods by basing stock selection and weighting on a company's fundamental financial indicators, such as earnings, book value, revenue, and dividends, rather than on market capitalization. The stocks priced below their intrinsic value based on these fundamentals are likely to outperform in the long run. This approach aims to mitigate the impact of market volatility and speculation, focusing instead on the underlying economic value and performance of companies. It offers a more grounded investment rationale compared to strategies that rely heavily on market price movements, appealing to investors seeking a value-oriented approach.

Risk-Oriented Strategies

Risk-oriented factor-based strategies focus on minimizing investment risk while still providing the opportunity for returns. By targeting factors related to volatility and portfolio variance, these strategies aim to create a more stable investment experience. Two primary types are Volatility Weighting and Minimum Variance Investing.

Volatility Weighting: Volatility Weighting is a strategy where the allocation of each stock in a portfolio is inversely related to its volatility. This means that stocks with lower volatility, indicating less price fluctuation, are given a higher weight compared to more volatile stocks. The core idea is to reduce the overall risk of the portfolio by emphasizing investments that are expected to be more stable. Volatility is typically measured using the standard deviation of price returns over certain periods, such as the past year (252 trading days) or the past three years (156 weeks). This approach is favored by investors who wish to maintain exposure to the equity market while minimizing the impact of market downturns.

Minimum Variance Investing: Minimum Variance Investing aims to construct a portfolio with the lowest possible volatility based on historical price movements. This strategy uses a mean-variance optimizer, a mathematical framework that integrates expected returns and the covariance of securities, to find the portfolio composition that minimizes overall volatility.

Constraints can be applied within the optimization process to ensure diversification, such as limiting the weight of any single stock, setting sector or country exposure limits, and maintaining certain levels of liquidity. Minimum variance portfolios are designed for investors looking for a reduced risk profile, focusing on stability and lower fluctuation in portfolio value, rather than maximizing returns.

Diversification-Oriented Strategies

Equally Weighted Indexes: Equal weighting is intuitive and has a low amount of single-stock risk. The low single-stock risk comes by way of the weighting structure of $1/n$, where n is equal to the number of securities held.

Maximum-Diversification Strategies: Aim to maximize the "diversification ratio" by optimizing the balance between the weighted average volatilities of the individual securities and the overall portfolio volatility.

Management and Costs

Factor-based strategies often require the use of multiple benchmark indexes for performance comparison, including a factor-based index and a broad market-cap-weighted index. This can lead to tracking error, which measures how closely a portfolio's returns match those of its benchmark. While factor-based strategies can be more cost-effective than active management, they may still incur higher management fees and trading commissions than broad-market indexing strategies. Despite the higher costs, factor-based strategies provide a structured, rules-based approach to gaining exposure to specific market segments, potentially offering advantages over active management.

Factor rotation involves adjusting exposures to different risk factors based on changing market conditions. This strategy allows investors to make active bets on the future performance of the market using index-based vehicles, offering a blend of active and passive management techniques.

Factor-based Strategies

Factor-based strategies are investment approaches that target specific drivers of return across asset classes. These strategies can involve higher management fees and trading commissions than broad-market indexing. However, they can provide nearly pure exposure to specific market segments, and there are numerous benchmarks against which to measure performance. An investor's process of changing exposures to specific risk factors as market conditions change is known as factor rotation. For example, an investor might rotate from a value factor to a momentum factor based on changing market conditions.

Practice Questions

Question 1: An investor is considering implementing an index-based strategy in their portfolio. They are primarily interested in achieving market return, or beta exposure, rather than seeking outperformance, or alpha. However, they are also interested in the potential for additional returns based on exposure to various factors. They are considering a factor-based strategy, sometimes referred to as "smart beta". What is a potential risk of this strategy that the investor should be aware of?

- A. The strategy may be easily replicated by other investors, leading to overcrowding and reducing the realized advantages of the strategy.
- B. The strategy will require continuous active management, which may be time-consuming and costly.
- C. The strategy will not provide any exposure to the market risk premium from the Capital Asset Pricing Model (CAPM).

Answer: **Choice A is correct.**

The potential risk of a factor-based strategy, or "smart beta", that the investor should be aware of is that the strategy may be easily replicated by other investors, leading to overcrowding and reducing the realized advantages of the strategy. Factor-based strategies are designed to exploit systematic risk factors that are believed to generate returns above the market return. However, as these strategies become more popular and widely adopted, there is a risk that the factors may become overcrowded. This can lead to diminished returns as more investors chase the same opportunities. Furthermore, if a factor becomes overcrowded, it may also become overpriced, which can lead to a subsequent price correction and potential losses for investors. Therefore, while factor-based strategies can offer potential for additional returns, they also carry risks that investors need to be aware of.

Choice B is incorrect. While a factor-based strategy does require some degree of active management, it is not necessarily time-consuming and costly. In fact, one of the

advantages of factor-based strategies is that they can be implemented in a systematic and rules-based manner, which can reduce the need for continuous active management. Furthermore, many factor-based strategies are implemented using index funds or ETFs, which can be more cost-effective than actively managed funds.

Choice C is incorrect. A factor-based strategy does not exclude exposure to the market risk premium from the Capital Asset Pricing Model (CAPM). In fact, the market risk premium is one of the factors that can be exploited in a factor-based strategy. The market risk premium represents the additional return that investors require for taking on the risk of investing in the market as a whole, as opposed to risk-free assets. Therefore, a factor-based strategy can provide exposure to the market risk premium, along with other risk factors.

Question 2: A financial advisor is recommending an index-based factor strategy to a client. This strategy can be used to complement a traditional market-cap-weighted indexed portfolio. The advisor explains that the difference between index-based factor investing and conventional active management is that with the former, active management takes place up front rather than continuously. However, the advisor also warns that factor-based strategies tend to concentrate risk exposures. What could be a potential consequence of this concentration of risk exposures?

- A. The client may be exposed during periods when a chosen risk factor is out of favor.
- B. The client may not be able to achieve the market return, or beta exposure, that they are seeking.
- C. The client may not be able to take advantage of the low-cost advantage of index funds.

Answer: **Choice A is correct.**

One potential consequence of the concentration of risk exposures in factor-based strategies is that the client may be exposed during periods when a chosen risk factor is out of favor. Factor-based strategies involve selecting securities based on certain

characteristics or "factors" that are expected to drive returns. These factors can include things like size, value, momentum, quality, and volatility. However, these factors can go in and out of favor depending on market conditions. If a chosen factor is out of favor, the client's portfolio could underperform the market. This is a key risk of factor-based strategies and something that investors need to be aware of. While these strategies can provide diversification benefits and potentially enhance returns, they also involve a higher degree of risk compared to traditional market-cap-weighted index strategies.

Choice B is incorrect. While it is true that factor-based strategies may not always achieve the market return, this is not a direct consequence of the concentration of risk exposures. Rather, it is a potential outcome of the active management component of these strategies. The goal of factor-based strategies is not necessarily to achieve the market return, but to outperform the market by exploiting certain risk factors. Therefore, the inability to achieve the market return is not a direct consequence of the concentration of risk exposures.

Choice C is incorrect. The potential inability to take advantage of the low-cost advantage of index funds is not a direct consequence of the concentration of risk exposures in factor-based strategies. While factor-based strategies can be more expensive than traditional index funds due to the active management component, this is not a result of the concentration of risk exposures. Rather, it is a result of the additional research and analysis required to identify and exploit the chosen risk factors.

Glossary

- **Beta Exposure:** A measure of a portfolio's sensitivity to market movements.
- **Capital Asset Pricing Model (CAPM):** A model that describes the relationship between systematic risk and expected return for assets.

- **Factor-Based Strategies:** Investment strategies that aim to manage risk and return in a portfolio by using factors that have shown to explain stock returns.
- **Smart Beta:** A type of factor-based strategy that uses alternative index construction rules instead of the traditional market capitalization-based indices.
- **Market-Cap-Weighted Indexed Portfolio:** A type of investment portfolio where each security is invested in proportion to its market capitalization.
- **Dividend Yield Strategies:** Investment strategies that focus on companies that pay out a high dividend yield.
- **Momentum Strategies:** Investment strategies that aim to capitalize on the continuance of existing market trends.
- **Volatility:** A statistical measure of the dispersion of returns for a given security or market index.
- **Minimum Variance Investing:** An investment strategy that aims to construct a portfolio with the lowest possible volatility.
- **Equally Weighted Index:** An index in which all components are assigned the same value.
- **Factor-based Strategies:** Investment strategies that target specific drivers of return across asset classes.
- **Factor Rotation:** The process of changing exposures to specific risk factors as market conditions change.

LOS LOS 36b. Compare different approaches to index-based equity strategies

Equity investment strategies, particularly those based on indexes, are a crucial part of the financial landscape. These strategies can be implemented using a variety of approaches, from the individual investor buying stocks on their own to hiring a professional subadviser to create and maintain the investment strategy. Essentially, any internal or external portfolio manager equipped with the necessary index data, trading tools, and skills can replicate these strategies. This is a stark contrast to actively managed funds, where the investment strategy is unique and developed by the active portfolio manager.

There are several ways to gain access to the desired performance stream of an investment strategy. These include pooled investments such as mutual funds and exchange-traded funds (ETFs), derivatives-based portfolios using financial instruments like options, futures, and swaps contracts, and direct investment in the stocks underlying the strategy. For instance, an investor might choose to invest in a mutual fund that tracks the S&P 500, or they might buy options contracts to hedge against potential losses. Some index-based investments are managed with a specific target beta in mind, and the performance of the managers is evaluated based on how closely they meet this target.

Portfolio managers often use futures and open-end mutual funds to transform a position, for example, converting cash into equity exposure. This process is known as **equitizing**. The choice of which method to use is largely determined by the financing costs of rolling the futures contracts over time. For instance, if the costs of rolling futures contracts are high, a manager might opt for open-end mutual funds instead. In the case of multinational indexes, it can be more efficient to buy a set of complementary exchange-traded funds to replicate market returns for the various countries. For example, an investor might buy ETFs that track the performance of markets in the US, Europe, and Asia to gain exposure to global equity markets.

Pooled Investments

Pooled investments are a popular choice for average investors due to their ease of purchase,

holding, and selling. This category includes **open-end mutual funds** and **exchange-traded funds (ETFs)**. These investment vehicles allow investors to pool their money together to invest in a portfolio of assets, providing diversification and professional management.

Open-End Mutual Funds

Open-end mutual funds are a type of pooled investment vehicle that allows investors to buy and sell shares directly from the fund at the net asset value (NAV) price. The fund continuously issues and redeems shares, hence the term "open-end". The Qualidex Fund, started in 1970, was the first open-end index mutual fund available to retail investors. It was designed to track the Dow Jones Industrial Average. An example of this would be the SPDR Dow Jones Industrial Average ETF (DIA), which also tracks the Dow Jones Industrial Average. The Vanguard S&P 500 Index Fund, started in 1975, was the first retail fund to attract investors on a large scale. This fund is similar to the iShares Core S&P 500 ETF (IVV), which also tracks the S&P 500 index.

Mutual Fund Investments

Mutual funds offer an efficient way to invest, monitor investments, and keep records. They are especially beneficial for those investing in index-based mutual funds. Investors need to analyze their return and risk objectives, investment constraints, and develop a matching strategy. Understanding financial goals, risk tolerance, and investment horizon is crucial.

Options for Purchasing Mutual Funds and Available Support

Investors can buy mutual funds directly from the fund adviser, through a fund marketplace, or with a financial adviser's help. The investment companies provide extensive support via websites and call centers for easier transactions and information access. A fund marketplace offers a streamlined process to invest in multiple funds from various providers under one account. This consolidation enhances the ease of record keeping and investment tracking.

Benefits of Index-Based Mutual Funds

Index-based mutual funds are cost-effective and offer structural convenience. These funds enable affordable access to broad market indices. Managing these funds involves rebalancing, reconstitution, and adjustments to mirror the benchmark index closely. Portfolio managers have duties including trading securities, managing cash, handling corporate actions, proxy voting, and reporting performance. While index-based funds are cost-efficient, they still incur expenses for registration, custodial services, and auditing, similar to actively managed funds.

Comprehensive Record Keeping and Regulatory Oversight

The operational integrity of mutual funds is upheld through rigorous record keeping, ensuring accurate documentation of share ownership, transaction histories, and pricing. Close collaboration between record keepers, custodians, and mutual fund sponsors guarantees the secure and precise handling of fund assets. Regulatory frameworks, such as the Investment Company Act of 1940 in the United States and the UCITS directive in the European Union, provide a structured and protective environment for mutual fund operations, safeguarding investor interests and promoting market stability.

Exchange-Traded Funds (ETFs)

Exchange Traded Funds (ETFs) are a type of investment fund and exchange-traded product, first introduced in the United States in 1993. The first ETF was launched in the Canadian market in 1990 to track the return of 35 large stocks listed on the Toronto Stock Exchange. A real-world example of this would be the iShares S&P/TSX 60 Index ETF (XIU), which tracks the S&P/TSX 60 index of large-cap Canadian stocks. They are designed to track the performance of a specific index, sector, commodity, or asset class. They can be bought and sold on a stock exchange, much like individual stocks, offering the flexibility of intraday trading. ETFs have gained popularity due to their ease of trading, low management fees, tax efficiency, and the ability to provide exposure to a wide array of indexes.

Structure of ETFs

The structure of an ETF involves two primary entities: the **fund manager** and the **authorized**

participant.

The **fund manager** oversees the ETF's management, including asset allocation and index tracking. The **authorized participant**, usually a significant financial institution, serves as a market maker, crucial in the ETF shares' creation and redemption process. Authorized participants help to stabilize supply and demand by creating or redeeming ETF shares as needed.

Tax Efficiency of ETFs

ETFs are known for their tax efficiency, making them an attractive investment option in regions where capital gains are taxable. The unique creation/redemption mechanism, often involving an in-kind exchange, minimizes the occurrence of taxable events. This process reduces the likelihood of realizing capital gains, thereby lowering the tax impact on investors compared to mutual funds.

Disadvantages of ETFs

ETFs have some disadvantages, including the bid-ask spread, which affects the buying and selling price of shares. Commission costs can accumulate with frequent trading, impacting overall investment returns. Market liquidity can pose a risk, potentially making it challenging to execute trades at desired prices or times.

Use of ETFs

ETFs have become a popular tool among financial advisers and large investors. They are often used to gain targeted exposure to specific sectors or asset classes. For example, a financial adviser might recommend a technology ETF to a client who wants to increase their exposure to the tech sector. Large investors, on the other hand, may find it more cost-effective to build their own portfolios using ETFs through strategies such as replication, stratified sampling, and optimization.

Limitations of ETFs

Despite their versatility, ETFs do have some limitations. One of these is that the number of benchmark indexes far exceeds the number of ETFs, meaning not all indexes have an ETF that tracks them. However, the ETF market is continually evolving, with new ETFs being created regularly. For instance, factor-based ETFs have emerged, providing exposure to specific factors such as Size, Value, Momentum, Quality, Volatility, and Yield.

Market Share of ETFs

As of the end of 2022, ETFs accounted for only 9% of equity assets across the United States, Europe, and Asia Pacific. The market share for fixed-income ETFs is even lower. These figures include index ETFs as well as factor-based and other types of ETFs.

Choosing between ETFs and Mutual Funds

The decision between investing in a conventional open-end mutual fund and an ETF often comes down to factors such as cost and flexibility. Long-term investors may benefit from the slightly lower expense ratios of ETFs compared to equivalent mutual funds. However, the brokerage fees associated with frequent trading of ETF shares can offset the advantage of lower expense ratios, making ETFs less economical for active traders.

Practice Questions

Question 1: A portfolio manager is looking to implement an index-based equity investment strategy. They have access to the index data, trading tools, and necessary skills to replicate the strategy. They are considering different approaches to gain access to the investment strategy's desired performance stream. Which of the following methods could the portfolio manager use to implement this strategy and gain the desired equity exposure?

- A. Investing in pooled investments such as mutual funds and exchange-traded funds, derivatives-based portfolios using options, futures, and swaps contracts, and direct investment in the stocks underlying the strategy.
- B. Investing only in actively managed funds.
- C. Investing only in the stocks underlying the strategy.

Answer: **Choice A is correct.**

The portfolio manager can implement an index-based equity investment strategy and gain the desired equity exposure by investing in pooled investments such as mutual funds and exchange-traded funds, derivatives-based portfolios using options, futures, and swaps contracts, and direct investment in the stocks underlying the strategy. This approach provides the portfolio manager with a diversified exposure to the equity market, which can help to reduce risk. Mutual funds and ETFs are designed to replicate the performance of a specific index, making them suitable for an index-based strategy. Derivatives can be used to gain exposure to the equity market without having to invest directly in the underlying stocks, which can be beneficial in terms of cost and efficiency. Direct investment in the stocks underlying the strategy allows the portfolio manager to have full control over the portfolio and to adjust the holdings as necessary to match the index.

Choice B is incorrect. Investing only in actively managed funds would not be an effective way to implement an index-based equity investment strategy. Actively

managed funds aim to outperform the market, not to replicate the performance of a specific index. Therefore, they may not provide the desired equity exposure. Furthermore, actively managed funds typically have higher fees than index funds or ETFs, which could reduce the net return on the investment.

Choice C is incorrect. Investing only in the stocks underlying the strategy could be a way to implement an index-based equity investment strategy, but it would not be the most efficient or cost-effective method. It would require the portfolio manager to buy and sell individual stocks to replicate the index, which could be time-consuming and costly due to transaction fees. Furthermore, it would not provide the benefits of diversification that can be achieved through pooled investments or derivatives.

Question 2: A portfolio manager is considering using futures and open-end mutual funds to transform a cash position and obtain the desired equity exposure, a process known as "equitizing". What factor would largely determine the choice of method to use in this scenario?

- A. The unique investment strategy developed by the active portfolio manager.
- B. The financing costs of rolling the futures contracts over time.
- C. The target beta established for the index-based investments.

Answer: **Choice B is correct.**

The factor that would largely determine the choice of method to use in this scenario is the financing costs of rolling the futures contracts over time. When a portfolio manager decides to equitize a cash position, they are essentially trying to gain exposure to the equity market without actually buying the underlying equities. This can be done using futures contracts or open-end mutual funds. However, futures contracts have an expiration date and need to be rolled over to maintain the equity exposure. This rollover process involves costs, including the bid-ask spread and any difference between the futures price and the spot price of the underlying asset. These costs can add up over time and can significantly impact the overall return of the portfolio. Therefore, the financing costs of rolling the futures contracts over time

would be a key factor in deciding whether to use futures or mutual funds for equitizing the cash position.

Choice A is incorrect. While the unique investment strategy developed by the active portfolio manager could influence the choice of method to use, it would not be the primary determinant. The choice between futures and mutual funds for equitizing a cash position is more a matter of cost and convenience, rather than investment strategy.

Choice C is incorrect. The target beta established for the index-based investments could influence the choice of method to use, but it would not be the primary determinant. The target beta is a measure of the portfolio's sensitivity to market movements and could be achieved using either futures or mutual funds. However, the costs associated with each method would be a more important factor in the decision.

Glossary

- **Pooled investments:** Investment vehicles that pool together money from multiple investors to invest in a portfolio of assets.
- **Open-end mutual funds:** A type of pooled investment vehicle that allows investors to buy and sell shares directly from the fund at the net asset value (NAV) price.
- **Net asset value (NAV):** The per-share value of a mutual fund or ETF, calculated by dividing the total value of all the securities in the portfolio by the number of fund shares outstanding.
- **Index-based mutual funds:** Mutual funds that aim to replicate the performance of a specific market index.
- **Rebalancing:** The process of realigning the weightings of a portfolio to maintain its original or desired balance of asset classes.
- **Reconstitution:** The process of changing the securities in a fund's portfolio to reflect

changes in the index it tracks.

- **Investment Company Act of 1940:** A U.S. federal law that regulates mutual funds and other companies that engage in the investment business.
- **Undertakings for Collective Investment in Transferable Securities (UCITS):** An agreement among countries in the European Union that governs the management and sale of collective investment funds across European borders.
- **Index-based equity investment strategies:** Investment strategies that aim to replicate the performance of a specific index.
- **Subadviser:** A professional investment manager hired to help oversee a portfolio.
- **Actively managed funds:** Investment funds where the portfolio manager makes specific investments with the goal of outperforming an investment benchmark index.
- **Derivatives-based portfolios:** Portfolios that include financial instruments like options, futures, and swaps, which derive their value from underlying assets.
- **Target beta:** A benchmark measure of a portfolio's or security's risk in relation to the market.
- **Equitizing:** The process of transforming a cash position into equity exposure.
- **Rolling futures contracts:** The process of extending the expiration or maturity of options or futures contracts by closing the initial contract and opening a new longer-term contract for the same underlying asset at the current market price.
- **Multinational indexes:** Indexes that track the performance of stocks across multiple countries.
- **Exchange Traded Funds (ETFs):** A type of investment fund and exchange-traded product, designed to track the performance of a specific index, sector, commodity, or asset class.
- **Authorized Participant:** A large financial institution that plays a crucial role in the

creation and redemption process of ETF shares.

- **Replication:** A strategy used by ETFs to track a particular index by buying all the assets in that index.
- **Stratified Sampling:** A strategy used by ETFs to track an index by buying a representative sample of the assets in that index.
- **Factor-based ETFs:** ETFs that aim to outperform market-cap-weighted indexes by selecting stocks based on factors such as size, value, momentum, quality, volatility, and yield.

LOS LOS 36c. Compare different approaches to index-based equity investing

Investors can access index performance through derivatives such as options, swaps, or futures contracts. These strategies are advantageous due to their low cost, ease of implementation, and provision of leverage. However, they also present risks, including counterparty default risk for derivatives not traded on exchanges or cleared through a clearing house. Derivatives can be relatively difficult for individual investors to access. For instance, an investor might use a futures contract on the S&P 500 Index to gain exposure to the performance of the index without having to buy all the individual stocks in the index.

Options, Swaps, and Futures Contracts

Options, swaps, and futures contracts are available on many major indexes, such as the MSCI EAFE Index and the S&P 500 Index. Options and futures are traded on exchanges and processed through a clearing house, which eliminates virtually all default risk. Equity swaps are generally executed with a single counterparty, adding the risk of default by that counterparty. For example, if an investor enters into an equity swap with a bank, and the bank goes bankrupt, the investor could lose their investment.

Leverage and Notional Value

Derivatives allow for leverage through their notional value amounts. The notional value of the contracts can be many times greater than the initial cash outlay. However, derivatives expire, whereas stocks can be held indefinitely. The risk of an expiring options contract is a complete loss of the relatively small premium paid to acquire the exposure. Futures and swaps can be extended by “rolling” the contract forward. For example, if an investor buys a futures contract on the S&P 500 Index with a notional value of \$1 million, they might only have to put up \$50,000 in initial margin, giving them a leverage ratio of 20:1.

Futures Commission Merchant (FCM)

Futures positions must be initiated with a futures commission merchant (FCM), a clearing house

member assigned to trade on behalf of the investor. The FCM posts the initial margin required to open the position and then settles on a daily basis to comply with the maintenance margin required by the clearing house. The FCM also helps close the position upon expiration. For example, if an investor wants to buy a futures contract on the S&P 500 Index, they would need to open an account with an FCM, who would then execute the trade on their behalf.

Derivatives as Portfolio Overlays

In investment management, derivatives play a crucial role in modifying existing portfolios to better align with investment objectives, effectively acting as an overlay. One common application is the completion overlay, which is used when an indexed portfolio drifts from its target exposure. The completion overlay helps adjust the portfolio back to its intended alignment. Another essential overlay is the rebalancing overlay, which facilitates the adjustment of a portfolio by selling and buying specific securities to maintain its desired composition. Currency overlays are also employed to hedge against foreign exchange risk, converting the returns of foreign investments back to the portfolio manager's home currency. For example, a portfolio manager managing a portfolio of European stocks may use a currency overlay to hedge the risk of euro fluctuation against the US dollar.

Advantages of Equity Index Derivatives

Equity index derivatives offer several advantages over cash-based portfolio construction approaches. They allow a portfolio manager to increase or decrease exposure to the entire index portfolio in a single transaction. Many derivatives contracts are highly liquid, sometimes more so than the underlying cash assets. However, strategic changes to portfolios are usually best made using cash instruments, which have indefinite expirations and do not necessitate rolling over expiring positions. For example, if a portfolio manager wants to increase their exposure to the S&P 500 Index, they could do so by buying a futures contract on the index, rather than buying all the individual stocks in the index. Equity index derivatives primarily include **futures** and **swaps**

Equity Index Futures

Equity index futures allow investors to gain exposure to a specific index. These contracts are distinct in that they are cash-settled, meaning that the transaction is completed with cash rather than the transfer of physical shares. The buyer of an equity index futures contract secures the right to purchase the underlying index at a predetermined price on the contract's expiration date. This arrangement is based on the futures price established when the derivative was initially acquired.

Advantages of Equity Index Futures

Futures contracts require only a small margin upfront, offering significant leverage potential, which can amplify gains (or losses).

There are fewer constraints on initiating futures positions, including short sales, compared to some stock investments, providing flexibility for investors.

Equity index futures are characterized by high liquidity, evident through low bid-ask spreads, facilitating easier entry and exit from positions.

Low commission and execution costs relative to the level of market exposure achieved make futures an efficient tool for adjusting portfolio equity risk.

Disadvantages of Equity Index Futures

The primary drawback is the risk of basis risk, which occurs when the futures and the underlying index prices do not move in sync, potentially leading to imperfect tracking of the benchmark.

Basis risk can be exacerbated by dividends paid on the underlying securities, which are not captured by the futures contract that only tracks index price movements.

This discrepancy can be partially offset by holding interest-bearing securities alongside futures positions to mitigate the impact of basis risk.

Margin Requirements and Risks

Futures account holders must also post margin. The margin amount varies by trading exchange.

For example, in the case of an S&P 500 futures contract, the initial margin required by the Chicago Mercantile Exchange for an overnight position is USD 6,600. The minimum maintenance margin for one contract is USD 5,400. If the contract unit value decreases by more than USD 1,200, a margin call will be triggered. This demonstrates how even a small change in the index value can result in a margin call once the mark-to-market process occurs.

Equity Index Swaps

Another derivatives-based approach is the use of equity index swaps. These are negotiated arrangements in which two counterparties agree to exchange cash flows in the future. For example, an investor with a USD 20 million notional amount may want to be paid the return on her benchmark index, the S&P 500, during the coming year. In exchange, the investor agrees to pay a floating rate of return of Market Reference Rate (MRR) + 0.20% per year, with settlement occurring semi-annually. The payment received by the portfolio manager is from the first leg of the swap, and the payment made by that manager is from the second leg.

Risks Associated with Equity Swaps

Equity swaps are subject to **counterparty risk**, where one party may default on their obligations.

They face **liquidity risk** due to their non-marketable nature, making it difficult to transfer the agreement to another party.

Interest rate risk affects the party responsible for payments linked to a floating interest rate (MRR), impacting the cost of the swap.

Swaps carry **tax policy risk**, as changes in tax legislation can affect the tax efficiency of swap agreements, which is often a motivation for their use.

Advantages of Equity Index Swaps

Equity swaps offer synthetic exposure to index returns, bypassing the limitations of exchange-traded futures that are only available for a select number of equity indexes.

They allow for **customization** in terms of the underlying index, settlement frequency, and maturity, offering flexibility to both parties.

Swaps can be negotiated for **long durations**, depending on the agreement between the counterparties.

Using a swap negates the need for transaction costs associated with purchasing all constituents of an index, making it a cost-effective strategy.

Like futures, swaps can be used to **add leverage or hedge** a portfolio on a tactical or short-term basis.

Equity index-based portfolios are a type of investment strategy where the portfolio is managed separately and is designed to replicate the performance of a specific index. This strategy requires a set of tools and resources to effectively manage the portfolio and ensure compliance with applicable laws and regulations. Let's delve deeper into the requirements and tools needed for managing such portfolios.

Separately Managed Equity Index-Based Portfolios

Data Subscription

Data subscription can be acquired directly from the index provider and may be offered on a daily or less-frequent basis. For example, data for the FTSE 100 index can be obtained directly from the London Stock Exchange. The data are provided for analysis only and a separate license must be purchased for index replication strategies. This is similar to how a music streaming service might provide songs for listening but require a separate license for commercial use. The index subscription data should include company and security identifiers, weights, cash dividend, return, and corporate action information. This information is crucial for accurately replicating the index and tracking its performance.

Trading Systems

Trading systems allow the manager to see her portfolio and compare it to the chosen benchmark.

For example, a manager using the Bloomberg Terminal can view her portfolio's performance and compare it to the S&P 500 index. Common features of trading systems include electronic communication with multiple brokers and exchanges, an ability to record required information on holdings for taxable investors, and modeling tools so that a portfolio can be traded to match its benchmark.

Accounting Systems

Accounting systems should be able to report daily performance, record historical transactions, and produce statements. These systems are crucial for tracking the portfolio's performance and ensuring accurate financial reporting. Portfolio managers rely heavily on their accounting systems and teams to help them understand the drivers of portfolio performance. For example, a manager might use the accounting system to identify which stocks are performing well and which are underperforming.

Broker Relationships

Broker relationships are an often-overlooked advantage of portfolio managers that can negotiate better commission rates. For example, a manager with a strong relationship with a broker might be able to negotiate a lower commission rate, thereby increasing the portfolio's net returns. Commissions are a negative drag on a portfolio's returns. The lower the commission rate, the higher the net return. The commission rates quoted to a manager can differ on the basis of the type of securities being traded, the size of the trade, and the magnitude of the relationship between the manager and broker.

Compliance Tools and Teams

Investors must adhere to a myriad of rules and regulations, which can come from client agreements and regulatory bodies. For example, a manager might need to comply with the SEC's rules on insider trading and the client's investment policy statement. Sanctions for violating compliance-related rules can range from losing a client to losing the registration to participate in the investment industry. This underscores the importance of having robust compliance systems

and teams. Compliance rules can be company-wide or specific to an investor's account. For example, a company might have a company-wide policy on ethical investing, while a specific client might have a policy against investing in tobacco companies.

Portfolio Management

Indexed portfolio managers must review their holdings and their weightings versus the index each day. This is crucial for ensuring that the portfolio accurately replicates the index and tracks its performance. To establish the portfolio, the manager creates a trading file and transmits the file to an executing broker, who buys the securities using a program trade. **Program trading** is a strategy of buying or selling many stocks simultaneously. Index portfolio managers may trade thousands of positions in a single trade file and are required to deliver the orders and execute the trades quickly. This is crucial for ensuring that the portfolio accurately replicates the index and tracks its performance.

Order Management System (OMS)

Portfolio managers use their OMS to model their portfolios against the index, decide which trades to execute, and transmit the orders. For example, a manager might use the OMS to decide to buy shares in Apple and sell shares in Microsoft to better match the S&P 500 index. Transmitting an order in the United States is generally done on a secure communication line, such as through FIX Protocol. International trading is usually communicated using a similar protocol through SWIFT.

Index-based Strategies

Index-based strategies seek to replicate an index that is priced at the close of business each day. For example, a manager might aim to replicate the performance of the S&P 500 index, which is priced at the close of the New York Stock Exchange each day. Most index-based trade executions take place at the close of the business day using market-on-close (MOC) orders. This is to ensure that the portfolio's performance closely tracks the index's performance.

Managers maintain the portfolio by trading any index changes, such as adds/deletes, rebalances,

and reinvesting cash dividend payments. For example, if a company is added to the S&P 500 index, the manager would need to buy shares in that company to accurately replicate the index.

Best practice would be to review the portfolio's performance each day and its composition at least once a month. This helps ensure that the portfolio continues to accurately replicate the index and track its performance.

Practice Questions

Question 1: A portfolio manager is considering the use of equity index derivatives to increase or decrease exposure to the entire index portfolio in a single transaction. Which of the following statements is true regarding the use of equity index derivatives and cash instruments?

- A. Strategic changes to portfolios are usually best made using equity index derivatives, which have indefinite expirations and do not necessitate rolling over expiring positions.
- B. Strategic changes to portfolios are usually best made using cash instruments, which have indefinite expirations and do not necessitate rolling over expiring positions.
- C. Equity index derivatives and cash instruments both have indefinite expirations and do not necessitate rolling over expiring positions.

Answer: **Choice B is correct.**

Strategic changes to portfolios are usually best made using cash instruments, which have indefinite expirations and do not necessitate rolling over expiring positions. Cash instruments, such as stocks and bonds, do not have an expiration date and can be held indefinitely by the investor. This makes them ideal for strategic changes to portfolios, as they provide a long-term exposure to the underlying assets. Furthermore, cash instruments do not require the investor to roll over expiring positions, which can be a complex and costly process. This is particularly important for strategic changes, which are typically long-term in nature and require a stable and consistent exposure to the underlying assets. Therefore, while equity index derivatives can provide a quick and efficient way to adjust the exposure to an entire index portfolio, they are not typically the best choice for strategic changes due to their finite lifespan and the need to roll over expiring positions.

Choice A is incorrect. Equity index derivatives, such as futures and options, do not