Learning Module 3
Overview of Asset Allocation

LOS: Describe elements of effective governance and investment governance considerations in asset allocation.

LOS: Formulate an economic balance sheet for a client and interpret its implications for asset allocation.

LOS: Compare the investment objectives of asset-only, liability-relative, and goals-based asset allocation approaches.

LOS: Contrast concepts of risk relevant to asset-only, liability-relative, and goals-based asset allocation approaches.

LOS: Explain how asset classes are used to represent exposures to systematic risk and discuss criteria for asset class specification.

LOS: Explain the use of risk factors in asset allocation and their relation to traditional asset class-based approaches.

LOS: Recommend and justify an asset allocation based on an investor's objectives and constraints.

LOS: Describe the use of the global market portfolio as a baseline portfolio in asset allocation.

LOS: Discuss strategic implementation choices in asset allocation, including passive/active choices and vehicles for implementing passive and active mandates.

LOS: Discuss strategic considerations in rebalancing asset allocations.

Investment Governance Background

LOS: Describe elements of effective governance and investment governance considerations in asset allocation.

Governance Structures

Governance focuses on clarifying the mission, creating a plan to achieve the objectives within the mission, and monitoring progress toward those objectives. **Management**, in contrast, executes the plan to achieve the objectives.

Effective investment governance models require inclusion of the following elements:

- Express short- and long-term objectives.
- Use the knowledge, capacity, time, and position in the hierarchy of functional units to allocate decision rights and responsibilities.
- Establish processes for developing the investment policy statement that will govern day-to-day operations.
- Establish processes for developing and approving the strategic asset allocation.
- Establish framework for reporting and monitoring progress toward objectives and goals.
- Periodically perform a governance audit.

An **investment committee**—the highest level of the investment governance hierarchy—usually retains approval over the strategic asset allocation and rebalancing framework due to its importance to risk and return levels. This applies whether the investment will have passive or active management. The investment committee will usually then delegate much of the management to some combination of **investment staff** and **third-party resources**.

Good governance also requires specifying rebalancing responsibilities. The investment committee for an institution might make rebalancing decisions itself or delegate such decisions to organizational staff or an external consultant. An individual investor might delegate rebalancing to an investment advisor.

LOS: Formulate an economic balance sheet for a client and interpret its implications for asset allocation.

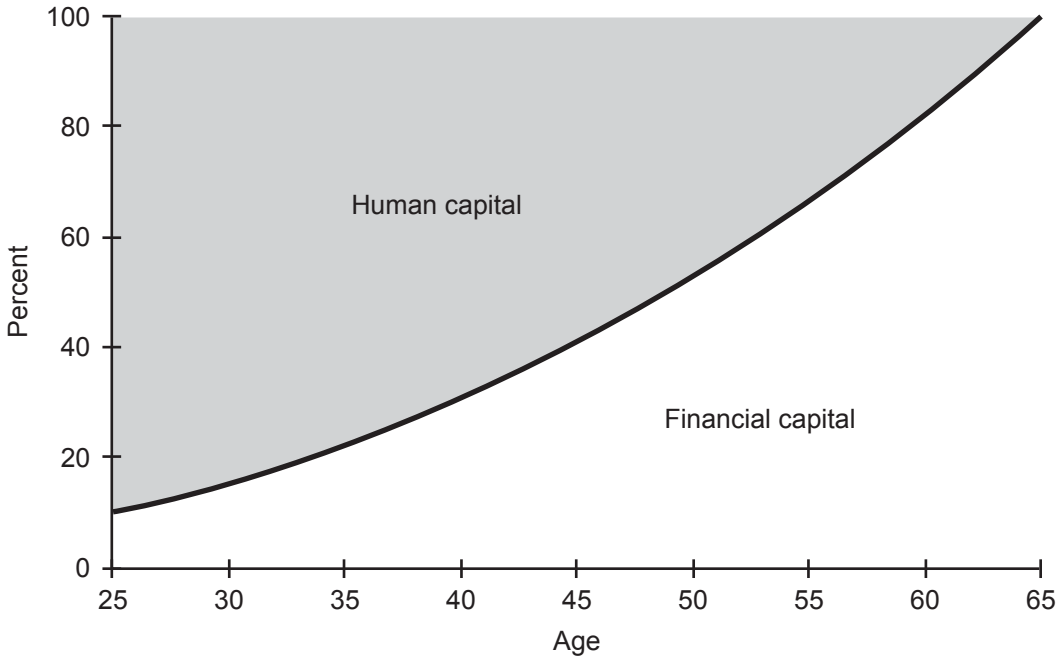
An **economic balance sheet** includes conventional assets and liabilities as well as extended portfolio assets and liabilities that are relevant to asset allocation decisions but are not listed on conventional balance sheets.

For individual investors, extended portfolio assets include **human capital**, **the economic present value of an investor's future labor income**, **pension income**, **and expected inheritances.** The present value of future consumption is an extended portfolio liability.

For institutional investors, extended portfolio assets might also include underground mineral resources or the present value of future intellectual property royalties. Extended portfolio liabilities might include the present value of prospective payouts.

Asset allocation considers the full range of assets and liabilities to arrive at an appropriate asset allocation choice. For example, including the sensitivity of an individual investor's earnings to equity market risk may result in a more (or less) appropriate allocation to equities. Figure 1 illustrates the path for the composition of an individual's economic balance sheet from age 25 through age 65.

Figure 1: Human capital (HC) and financial capital (FC) relative to total wealth



At age 25, most of an individual's working life is ahead of him or her. Therefore, human capital dominates the economic balance sheet. As the individual ages, the present value of human capital decreases as human capital is converted into earnings. Earnings saved and invested accumulate financial capital. By a retirement age of 65, the conversion of human capital to earnings and financial capital is complete.

Human capital is roughly 30% equity-like and 70% bond-like. In this case, the asset allocation chosen for financial capital should reflect an increasing allocation to bonds as human capital declines to age 65.

Approaches to Asset Allocation

LOS: Compare the investment objectives of asset-only, liability-relative, and goals-based asset allocation approaches.

LOS: Contrast concepts of risk relevant to asset-only, liability-relative, and goals-based asset allocation approaches.

There are three broad approaches to asset allocation: (1) asset-only, (2) liability-relative, and (3) goals-based.

The **asset-only approach** focuses on the assets side of the investor's balance sheet, and liabilities are not explicitly modeled. For example, mean-variance optimization (MVO) is an asset-only approach that considers only the expected returns, risks, and correlations of the asset classes in the opportunity set.

The **liability-relative approach**, or **liability-driven investing (LDI)**, explicitly accounts for the liabilities side of the economic balance sheet, dedicating assets to meet legal liabilities and quasi-liabilities. The liability-

relative approach to asset allocation chooses an asset allocation that provides for the money to pay liabilities when they come due. When constructing a liability-hedging portfolio, the remaining balance of assets can be invested in a riskier-asset portfolio because it explicitly seeks return above and beyond the liability benchmark.

There are distinctions between liabilities for an institutional investor and goals for an individual investor that have implications for asset allocation:

- Liabilities of institutional investors are legal obligations, whereas goals are not. Failing to meet them does not trigger similar consequences.
- Institutional liabilities, such as life insurer obligations or pension benefit obligations, are uniform in nature (all of a single type), whereas an individual's goals may be many and varied.
- Liabilities of institutional investors of a given type are numerous and can be forecasted with confidence. Individual goals are not. For example, the number of remaining years of life for a 65-year-old individual is very uncertain, whereas insurers can estimate the average for a group of 65-year-olds with some precision.

The **goals-based approach**, or **goals-based investing (GBI)**, specifies sub-portfolios aligned with each of an individual investor's specific goals, ranging from supporting lifestyle needs to aspirational goals. For example, retirees might specify a goal of maintaining their current lifestyle and a goal of leaving a bequest to their children. Each goal is associated with regular, irregular, or bulleted cash flows, as well as a distinct time horizon and a risk tolerance level. The sum of all sub-portfolio asset allocations results in an overall strategic asset allocation for the total portfolio.

Asset-only approaches use volatility (standard deviation) and the correlations of asset class returns to minimize risk at a given level of return. Other risk measures include risk relative to a benchmark (e.g., tracking risk) and downside risk (i.e., semivariance, value at risk [VaR]). Monte Carlo simulation also provides information about how an asset allocation performs when one or more variables are changed.

Liability-relative approaches to asset allocation focus on the risk of not having enough assets to pay obligations when due and use shortfall risk as a measure of risk. Shortfall risk reflects the differences between asset and liability characteristics (e.g., their relative size, their interest rate sensitivity, their sensitivity to inflation, etc.).

Goals-based approaches are concerned with the risk of failing to achieve goals and can be quantified as the maximum acceptable probability of not achieving a goal.

Modeling Asset Class Risk

LOS: Explain how asset classes are used to represent exposures to systematic risk and discuss criteria for asset class specification.

An asset class can be defined as a set of assets that have economic similarities to each other, and that have characteristics that make them distinct from other assets. Asset classes are the traditional units of analysis in asset allocation and reflect systematic risks with varying degrees of overlap. The sources of risk for more broadly defined asset classes are better distinguished than those for narrowly defined subgroups. Effective portfolio optimization and construction may be hindered by excessive asset class granularity. For example, U.S. large-cap equity and U.S. small-cap equity would have more common risks than would U.S. and non-U.S. equity. Therefore, the allocation among broadly defined asset classes is more important than the allocation to the various sub-classes of each asset class.

The listing of asset classes often includes the following:

- **Global public equity**—includes developed, emerging, and frontier markets and large-, mid-, and small-cap asset classes.

- **Global private equity**—includes venture capital, growth capital, and leveraged buyouts.
- **Global fixed income**—includes developed and emerging market debt and is further divided into sovereign, investment-grade, high-yield, inflation-linked, cash-equivalent, and short-duration securities.
- **Real assets**—include assets that provide sensitivity to inflation, such as private real estate equity, private infrastructure, and commodities.

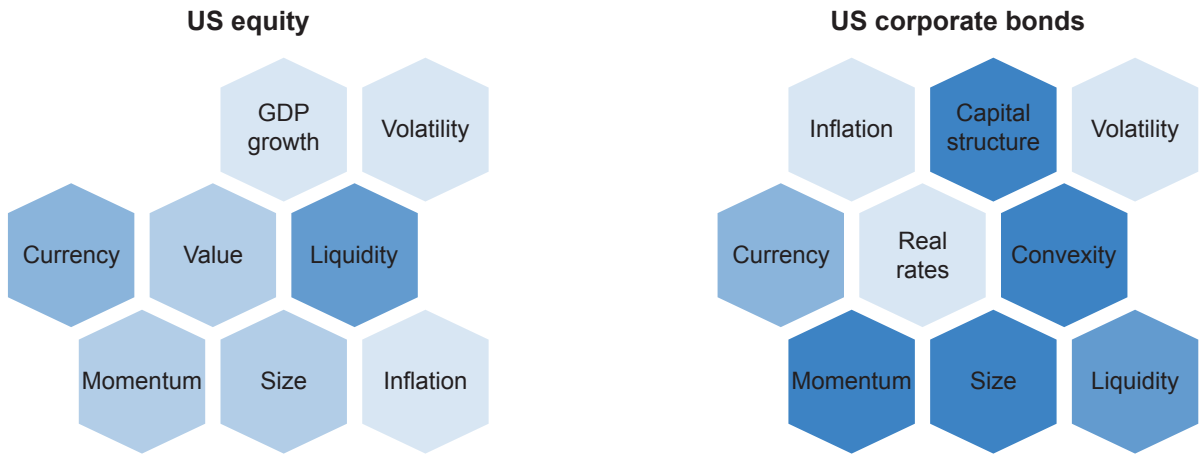
For the purpose of asset allocation, the following are five criteria in specifying asset classes:

1. **Assets within an asset class should be homogeneous**. Assets within an asset class should have similar attributes (e.g., real estate).
2. **Asset classes should be mutually exclusive**. Overlapping reduces the effectiveness of controlling risk and hinders asset class return expectations (e.g., U.S. equities and global equities that include U.S. equities).
3. **Asset classes should be diversifying**. An asset class should not have high expected correlations with other asset classes because of redundancy, which will duplicate the risk exposures already present.
4. **The asset classes as a group should make up most of the world's investable wealth**. From a portfolio theory perspective, this criterion should increase the expected return for a given level of risk.
5. **A selected asset class should absorb a large proportion of an investor's portfolio**. An asset class may not be practically suitable for investment if liquidity and transaction costs are unfavorable.

LOS: Explain the use of risk factors in asset allocation and their relation to traditional asset class-based approaches.

Traditional asset allocation uses asset classes as the unit of analysis. Modeling using asset classes as the unit of analysis tends to obscure the portfolio's sensitivity to overlapping risk factors, such as inflation risk, illustrated in Figure 2. As a result, controlling risk exposures may be problematic.

Figure 2: Common factor exposures across asset classes



Factor-based approaches do not use asset classes as the basis for portfolio construction but rather focus on assigning investments to the investor's desired exposures to specified risk factors. Multifactor risk models are able to control the systematic risk exposures in asset allocation. When using factors as the units

of analysis, we begin with specifying risk factors and the desired exposure to each factor. Asset classes can be described with respect to their sensitivities to each of the factors.

Strategic Asset Allocation

LOS: Recommend and justify an asset allocation based on an investor's objectives and constraints.

The **policy portfolio** is the strategic asset allocation expected to achieve investment objectives given risk tolerance and investment constraints. Determining the asset allocation for the policy portfolio depends in part on the type of allocation specified by the strategy.

This process generally involves the following steps:

- Determine the investor's return objective and risk tolerance.
- Determine the investment horizon and any other relevant constraints for the portfolio.
- Determine the most suitable approach.
- Identify the set of asset classes and form capital market expectations for each.
- Develop a range of asset allocation choices and test each.

The last two steps can then be repeated until an allocation is chosen.

Asset-Only

Asset-only allocation establishes portfolios based on efficient use of asset risk. Given a set of asset classes and assumptions concerning their expected returns, volatilities, and correlations, the mean-variance optimization approach delineates an efficient frontier of portfolios expected to offer the greatest return at each level of portfolio return volatility—hence, the highest Sharpe ratio among portfolios with the same volatility of return.

An example of an investor that might use an asset-only approach is the hypothetical Federal Oil Fund of Canada (FOFC). The fund estimates that distributions in the interest of intergenerational equity may need to begin in 20 years. Financial assets are CAD 80 billion at market value. Cash inflows from oil exports are assumed to grow at inflation plus 1% for the next 15 years, and the present value of expected future income from state-owned reserves is estimated to be CAD 120 billion. Future spending needs are positively correlated with consumer inflation and population growth. In Table 1, the amount for the present value (PV) of future spending, which FOFC has not yet determined, is a placeholder to balance assets and liabilities; as a result, no equity is shown.

Table 1: FOFC economic balance sheet (in CAD billions), December 31, 20X6

Assets		Liabilities and Net Worth	
Financial assets		*Financial liabilities*	
Investments (includes cash, equities, fixed income, and other investments)	80		

Assets		Liabilities and Net Worth	
Extended assets		*Extended liabilities*	
PV of expected future income	120	PV of future spending net worth	200
		Economic net worth	0
Total	200		200

The amount and the timing of funds needed for future distributions are unclear. Therefore, the fund can focus on the efficient use of asset risk to grow assets within the limits of the fund's risk tolerance. The fund will primarily consider the expected return in relation to volatility in selecting an asset allocation.

FOFC quantifies its risk tolerance as willingness to bear portfolio volatility of up to 8.5% per year, partly based on FOFC's unwillingness to allow the fund to fall below 90% funded. FOFC also decides it is willing to tolerate a 5% chance of losing 11% or more of portfolio value in a given year. This risk is evaluated by examining the 1-year 5% VaR of potential asset allocations.

FOFC's current strategic asset allocation, along with several alternatives that have been developed by its staff during an asset allocation review, are shown in Table 2.

Table 2: FOFC strategic asset allocation decision

		Asset Allocation		
		Proposed		
Investment	**Current**	**A**	**B**	**C**
Equities				
Domestic	45%	35%	40%	35%
Global ex-domestic		15%	25%	20%
Bonds				
Nominal	35%	25%	20%	10%
Inflation-linked				10%
Real estate	20%	15%	15%	15%
Hedge funds		10%		10%
Portfolio Statistics				
Expected arithmetic return	4.25%	4.12%	4.44%	4.10%

		Asset Allocation		
		Proposed		
Investment	**Current**	**A**	**B**	**C**
Volatility (standard deviation)	7.79%	7.12%	8.32%	7.03%
Sharpe ratio	0.353	0.369	0.353	0.370
1-year 5% VaR	8.56%	7.59%	9.24%	7.47%

The current asset allocation and the alternatives all satisfy FOFC's tolerance for volatility and VaR limit. The alternatives have slight changes from the current strategic asset allocation.

Compared to the current allocation, Portfolio A diversifies the allocation to include non-domestic equities and hedge funds. Given FOFC's long investment horizon and low liquidity needs, an allocation to hedge funds at 10% is not a liquidity concern. Because hedge funds are more liquid than private real estate, the overall liquidity profile of the fund improves. Portfolio A has a lower volatility (by 67 bps) and slightly lower tail risk (5% VaR). Portfolio A's Sharpe ratio is slightly higher. Portfolio A appears to be an incremental improvement on the current asset allocation.

Compared with Portfolio A and the current asset allocation, Portfolio B increases the allocation to equities by 15 percentage points and reduces the allocation to bonds and, in relation to Portfolio A, hedge funds. Although Portfolio B has a higher expected return and its VaR is within FOFC's tolerance of 11%, Portfolio B's lower Sharpe ratio indicates that it makes inefficient use of its additional risk. Portfolio B does not appear to be a portfolio worth considering.

Compared with the current asset allocation and Portfolio A, Portfolio C's 55% allocation to equities is higher and more diversified considering the higher 20% allocation to non-domestic equities. Portfolio C's allocation to fixed income is 20% compared with 25% for Portfolio A and 35% for the current asset mix. The remaining fixed-income allocation has been diversified with an exposure to both nominal and inflation-linked bonds. The hedge fund allocation is funded by a combination of the reduced weights to fixed income and real estate. Portfolio C's increase in equity has merit because more equity-like choices in the asset allocation could be expected to give FOFC more exposure to the GDP growth factor. Within fixed income, Portfolio C's allocation to inflation-linked bonds can hedge the inflation risk inherent in future distributions. Portfolio C has the lowest volatility and the lowest VaR among the asset allocations, although the differences compared with Portfolio A are very small. Portfolio C's Sharpe ratio is comparable to Portfolio A's.

Overall, Portfolio A and Portfolio C appear to be improvements over the current mix, with Portfolio C having a slight edge over Portfolio A.

Liability-Relative

In the liability-relative approach, we take the defined benefit (DB) pension plan of hypothetical FOFC. FOFC is the sponsor of a $2.5 billion legacy DB plan, which is now frozen (i.e., no new plan participants and no new benefits accruing for existing plan participants). The FOFC pension plan is slightly overfunded, with a funded ratio of 1.15.

Assets amount to $2.5 billion at market values, as shown in Table 3. Given a funded ratio of 1.15, the implied projected distributions to pension beneficiaries have a present value (PV) of $2.174 billion at market value.

Table 3: FOFC pension plan economic balance sheet (in CAD billions), December 31, 20X6

Assets		Liabilities and Net Worth	
Financial assets		*Financial liabilities*	
Pension assets	2.5	PV of pension liability	2.174
		Net worth	
		Economic net worth	0.326
Total	2.5		2.5

The plan sponsor examines two asset allocation recommendations. Recommendation A does not explicitly consider the FOFC pension plan's liabilities but instead considers an asset-only perspective: a mean-variance efficient frontier given a set of capital market assumptions. Recommendation B does explicitly consider liabilities, implementing a liability-hedging portfolio based on FOFC pension liabilities and a return-seeking portfolio.

When considering an asset allocation, pensioners want to receive the stream of promised benefits with as little risk as possible, while the plan sponsor wants to avoid making contributions to make up a deficit in pension assets. Thus, possible asset allocations generally involve risk trade-offs.

Recommendation A, based on an asset-only approach, involves a 65% allocation to global equities and a 35% allocation to global fixed income. Assume that this asset allocation is mean-variance efficient and has the highest Sharpe ratio among portfolios that meet the pension's assumed tolerance for asset return volatility. Capital market assumptions indicate that equities have a significantly higher expected return and volatility than fixed income.

Recommendation B, based on a liability-relative approach, results in an allocation of $2.25 billion to a liability-hedging fixed-income portfolio that is matched in interest rate sensitivity to the present value of plan liabilities and a $0.25 billion allocation to a return-seeking equities portfolio. This is a proportional allocation of 10% to equities and 90% to fixed income. The equities allocation is believed to provide potential for increasing the size of the buffer between pension assets and liabilities with minimal risk to funded status. However, Recommendation B lies below the asset-only efficient frontier with a lower expected return as compared to Recommendation A.

Given capital market assumptions, Recommendation A is expected to increase the size of the buffer between pension assets and liabilities, but the sponsor does not benefit from increases in the buffer if the current buffer is adequate. However, with a 0.65 x $2.5 billion = $1.625 allocation to equities and a current buffer of assets of $2.5 billion – $2.174 billion = $0.326 billion, a decline of that amount or more in equity values (a 20% decline) would put the plan into underfunded status. Thus, Recommendation A creates contribution risk for the plan sponsor without a potential upside benefiting either the sponsor or the beneficiaries.

For Recommendation B, because the risk characteristics of the $2.25 billion fixed-income portfolio are closely matched with those of the $2.174 billion of pension liabilities with a buffer, the plan sponsor should not face any meaningful risk of needing to make further contributions to the pension. Both parties are pleased because pensioners expect the plan to be fully funded on an ongoing basis without any reliance on the sponsor's ability to make additional contributions.

Goals-Based

We use the hypothetical McDavid family to present elements of a goals-based approach. Edith is a 54-year-old technology entrepreneur. Connor is 55 years old and employed as an aerospace engineer. They have two unmarried children aged 25 (Dorothy) and 18 (Durante). Dorothy has a daughter with special needs.

The McDavid family has a portfolio of $50 million with $2 million in margin debt, as well as residential real estate of $6 million with $2 million in mortgage debt, as shown in Table 4. Pre-retirement earnings are expected to total $32 million in present value terms (human capital). Durante will soon begin studying at a 4-year private university; the present value of the expected contribution is $500,000. The McDavids desire to give a gift to a local charity in 5 years. In present value terms, the gift is valued at $1.5 million. The McDavids want to establish a trust for their daughter with a present value of $6 million to be funded at the time of Connor's death. The present value of future consumption expenditures is estimated at $40 million.

Table 4: McDavid Family: Economic balance sheet (in USD millions), December 31, 20X6

Assets		Liabilities and Net Worth	
Financial assets		*Financial liabilities*	
Investment portfolio	50	Margin debt	2
Real estate	6	Mortgage	2
Extended assets		*Extended liabilities*	
Human capital	32	Durante’s education	0.50
		Local charity	1.50
		Special needs trust	6
		PV of future consumption	40
		Net worth	
		Economic net worth (economic assets less economic liabilities)	36
Total	88		88

From Table 4, we can identify four goals totaling $48 million in present value terms: a lifestyle goal assessed as a need for $40 million in present value terms, an education goal of $0.50 million, a charitable goal of $1.5 million, and the special needs trust of $6 million.

The present value of expected future earnings, human capital, at $32 million is less than the lifestyle present value of $40 million, which means that some part of the investment portfolio must fund the McDavids’ standard of living. Note that although the McDavid family has $36 million of economic net worth, most of this comes from the $32 million extended asset of human capital. Specific investment portfolio assets have not yet been dedicated to specific goals.

In Table 5, the McDavids' lifestyle goal is split into three components: a component called "lifestyle—minimum" intended to provide protection for the McDavids' lifestyle in a disaster scenario, a component called "lifestyle—baseline" to address needs outside of worst cases, and a component called "lifestyle—aspirational" that reflects a desire for a chance at a markedly higher lifestyle. These sum to the present value of future consumption shown in the preceding Table 4. Table 5 describes these qualitatively.

Table 5: McDavid Family: Required probability of meeting goals and goal time horizons

Goal	Required Probability of Achieving	Time Horizon
Lifestyle—minimum	Extremely high	Short to distant
Lifestyle—baseline	Very high	Short to distant
Lifestyle—aspirational	Moderate	Distant
Education	Very high	Short
Trust	High	Long
Charitable	Moderate	Short

The trust goal is more important for the McDavids; they might delay or forgo the charitable contribution if required to meet the trust goal. Although parts of the McDavids' lifestyle goals run the spectrum from short to distant time horizons, they also have significant current earnings and human capital, which transforms into earnings as time passes. This puts the investment portfolio's role in funding the lifestyle goal further into the future.

Goals-based approaches set the strategic asset allocation in a bottom-up fashion. The McDavids' lifestyle goal might be addressed with three sub-portfolios, with the longest horizon sub-portfolio being less liquid and accepting more risk than the others. Although for the FOFC pension plan, no risk distinction was made among different parts of the pension liability via the asset allocation, such distinctions are made in goals-based asset allocation.

Separate sub-portfolios could be assigned to the special needs and charitable goals with asset allocations that reflect the associated time horizons and required probabilities of not attaining these goals.

LOS: Describe the use of the global market portfolio as a baseline portfolio in asset allocation.

The global market portfolio represents a highly diversified asset allocation that can serve as a baseline asset allocation in an asset-only approach. This portfolio, which sums all investable assets (global stocks, bonds, real estate, etc.) held by investors, reflects the balancing of supply and demand across world markets. It is the portfolio that minimizes diversifiable risk, which in principle is uncompensated. Therefore, it is the available portfolio that makes the most efficient use of the risk budget. Other arguments for using it as a baseline include its position as a reference point for a highly diversified portfolio and the discipline it provides in relation to mitigating any investment biases, such as home-country bias. The global market portfolio can serve as a starting point for discussion and ensures that the investor articulates a clear justification for moving away from global capitalization market weights.

Implementation Choices

LOS: Discuss strategic implementation choices in asset allocation, including passive/active choices and vehicles for implementing passive and active mandates.

After establishing the strategic asset allocation policy, the asset owner must address the strategic passive/active choice before moving on to implementation. The first consideration of passive/active choice is whether to tactically deviate from strategic asset allocation. The second consideration relates to passive and active implementation choices in investing the allocation to a given asset class.

Passive/Active Management of Asset Class Weights

Tactical asset allocation (TAA) deliberately under- or overweights (i.e., tilts) asset classes relative to their target weights in the policy portfolio in an attempt to add value. TAA involves tactical bets based on short-term expectations and perceived disequilibria that indicate transitory deviations from expected long-term relationships. An investor may make occasional tactical weight adjustments in some circumstances or may have an ongoing and more systematic program of tactical adjustments (dynamic asset allocation).

TAA is active management at the asset-class level. Thus, in a top-down perspective, TAA would follow the strategic asset allocation decision and stand one level above decisions about how to manage money within an asset class. The potential benefits of TAA must be examined on an after-costs basis, including transaction costs and taxes.

Passive/Active Management of Allocations to Asset Classes

For each asset class specified in the investor's strategic asset allocation, the investor will need to select an implementation approach. At the broadest level, the choice is between passive investing, active investing, or a mix of both active and passive suballocations.

Passive investing can be implemented through a tracking portfolio, such as an exchange-traded fund or a mutual fund, designed to replicate the returns to a broad investable index representing that asset class. Indexing is the lowest-cost approach to investing but still involves transaction costs as the fund purchases and sells securities that move in and out of the index. With a passive management approach, portfolio composition does not react to changes in the investor's capital market expectations or insights into individual investments.

Active investing can be implemented through a portfolio of securities that reflects the investor's perceived special insights and skill and makes no attempt to track an asset-class index's performance. For an active management strategy, the investor will respond to changing capital market expectations or to investment insights resulting in changes to portfolio composition. The objective of active management is to achieve, after expenses, positive excess risk-adjusted returns relative to a passive benchmark.

The range of implementation choices can be viewed as falling along a passive/active spectrum because some strategies use both passive and active elements. For example, an investor who indexes to a value equity index is active with regard to value tilting but passive in implementation because it involves indexing.

Factors that influence asset owners' decisions on where to invest on the passive/active spectrum include the following:

- **Available investments**. The availability of an investable index for indexing.
- **Scalability of active strategies**. The value added may begin to decline at some level of assets under management. For some small investors, participation may not be available below some asset level.

- **The feasibility of investing passively while incorporating client-specific constraints**. For example, an investor's environmental, social, and governance (ESG) investing criteria may not meet those of existing index products.
- **Beliefs concerning market informational efficiency**. Believing that the market is efficient would lead the investor toward passive investing.
- **The trade-off of benefits relative to costs and risks of active investing**. The management costs, trading costs, and turnover-induced taxes in active investing must be weighed relative to the lower costs of indexing.
- **Tax status**. Taxable investors tend to have higher hurdles to profitable active management than tax-exempt investors.

Rebalancing: Strategic Considerations

LOS: Discuss strategic considerations in rebalancing asset allocations.

Rebalancing is the discipline of adjusting portfolio weights to the strategic asset allocation. Rebalancing serves to control portfolio risks that have become different from what the investor originally intended. Not rebalancing allows the higher-return, inherently higher-risk assets to grow and dominate the portfolio, increasing portfolio risk and negating an intended level of diversification.

Rebalancing may be necessary under two conditions:

- Changes to the policy portfolio because of changes in an investor's investment objectives and constraints, or because of changes in long-term capital market expectations.
- Adjusting the actual portfolio to the strategic asset allocation because asset price changes have moved portfolio weights away from the target weights beyond tolerance limits.

Rebalancing approaches include:

- **Calendar-based approaches**. This approach rebalances the portfolio to target weights on a periodic basis, such as quarterly.
- **Range-based approaches**. This approach sets rebalancing thresholds (trigger points) around target weights. The ranges may be fixed width, percentage based, or volatility based. For example, a target allocation to equities could be 50% with a permissible range of 46% to 54%. When a threshold is breached, the asset-class weight may be rebalanced back to the target weight of 50%.

Range-based rebalancing permits tighter control of the asset mix compared with calendar-based rebalancing. Considerations in rebalancing also include the investor's risk tolerance, the asset's volatility correlations with other asset classes, and transaction costs.