

Investment Strategy

Assets, Strategy and Process

Investment Management Division

Arizona State Retirement System

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Outline

- 1 Introduction
- 2 Assets
- 3 Strategy
 - Risk
 - Risk Limitations
 - Asset Class Implementation Plans
 - Tactical Management
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 - Value Creation Processes
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Assets, Strategy and Process

- In this investment strategy paper, we will be talking about assets, strategy and process
- Assets are the things we own and are the foundation of the return generation process
- By strategy we refer to methods to enhance returns compared to market weight passive implementations through index selection, systematic strategies, trading, tactical positioning, idiosyncratic risk and other methods. As part of strategy, we define and establish targets for leverage and liquidity. We also define and quantify target return enhancements from various elements of strategy.
- By process we refer both to methods, such as research, statistical methods and performance measurement, that feed the investment decision making process as well as governance methods to ensure that the implementation meets regulatory and policy requirements

What's new?

- In the past, the board has approved a “Strategic Asset Allocation”
- This document includes a strategic asset allocation, but also goes beyond that by describing strategies and processes which will be used in implementing the investment program
 - As part of this we have collaborated with our consultant to provide estimates for future returns on assets taking in to account our strategies
- By expanding the scope in this way, we are now explicit in articulating strategies for all our asset classes
 - We also require that every asset class has an implementation plan reviewed at least annually by the Asset Class committee operating as required under SIP006
 - The implementation plan will contain a market review, will establish shorter term goals and strategies as well articulating a plan to ensure adequate diversification
- Previously, the board had approved asset class strategies for real estate, private equity and some opportunistic investments. This document and the required annual implementation plans replace the prior approved strategy documents for these asset categories

Focus on the Long Run

- This is intended as a true long range plan focused on a horizon of 20 to 30 years
- Even though this plan will be reviewed every four years, the focus of asset allocation and strategy articulation is on a much longer time frame
- Near term return expectations are considered as part of the annual implementation plans and tactical positioning activities, but are not a focus of this document
 - Our consultant considers both near term and long run return expectations in the companion document which estimates returns under this strategy

How to read this document

- This document contains both background and explanatory information as well as regulatory text which are intended as board policy
- Sentences typed like this are intended as background text and do not have the force of regulation or policy

Policy

Policy statements appear in a box like this. Policy statements in this document direct investment activities and must be complied with. Only the ASRS board can change board adopted policies.

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Assets

- Assets are the foundation of an investment strategy and the primary driver of returns
- Assets are things you can own that store value
 - Investable assets are ones that can be legally bought and sold, have a system of title or other legal protections making them suitable for investors
 - Asset values are established in competitive markets
 - The main types of assets we will address are:
 - Stocks and other means owning rights to the profits of companies and derivatives thereof
 - Sovereign bonds and high grade corporate bonds which are securities reflecting a right to receive payments of principal and interest (usually notional, but can be indexed to inflation) where the primary risk is changes in interest rates and the relative valuation of currency in which the debt is denominated and derivatives thereof
 - “Credit” which are bonds or other loans to companies or individuals where the primary risk is the ability of the company to repay and derivatives thereof
 - Real estate which is non-movable real property where the owner seeks to profit by collecting rents or other payments for the rights to use the property and through the potential appreciation of the property
 - Multi-asset strategies that span asset types, typically implemented as long/short derivatives portfolios
 - Our intention is that all assets which may legally be owned and traded are potential investments

The Size of Asset Markets

- The size of global markets is of interest because it implies a “market portfolio”
 - There is considerable academic debate about this concept including both the scope of assets and method of measurement
 - Some advocate broad definitions including human capital
 - Others advocate narrow definitions of “investable” assets in regularly traded markets
 - Our view is that it is useful to know global market sizes but we are cautious about any inference of optimality of this as a portfolio
 - Approximate major asset category sizes
 - Stocks – \$70 trillion
 - Privately owned companies – unknown but large
 - Bonds and other debt – \$200 trillion of which \$60 trillion is sovereign
 - Real estate – \$200 trillion including owner occupied, \$25 trillion in “investor” hands
 - Cash (Currency and bank deposits) – \$30 trillion
 - Gold – \$8 trillion
 - Art and other collectibles – unknown but large
 - Our view is that the core assets for a portfolio are stocks, bonds and real estate
 - These are the traditional and largest markets for enhancing and storing wealth
 - These assets generate earnings, interest and rents providing cash flow which is the basis of their valuation
 - Cash is needed operationally but our view is that it should normally be “assetized”
 - We would include other assets (such as multi-asset and other derivative strategies) if they are expected to be accretive to total return

Asset Selection

- In selecting assets for a recommended portfolio, our considerations include
 - designing a portfolio that includes the major assets in the market portfolio
 - that is broadly diversified across asset types, geography and the fundamental risk factors that drive returns
 - is designed to meet the actuarial return over the long run
 - and is readily investable
- Flexibility is of paramount importance so strategies can be adjusted to changing circumstances and capital markets dynamics
 - We establish broad ranges for assets
 - provide an annual review process to adjust strategies
 - and provide that this investment strategy shall be reviewed at least every four years

Benchmark Selection

- Benchmarks are needed to assess the quality of implementation of a strategy
- Benchmarks should be investable
- Stocks are the easiest class to benchmark
 - There are many published indices with a variety of characteristics
 - We are recommending ACWI-IMI which is the broadest, yet liquid and investable, index
 - It represents essentially all global investable stocks without any bias or filter other than liquidity
- Because of the large number of issues, indexing bonds is different from stocks
 - Even though there is an effort through these indices to define an aggregate market portfolio, they fall short on investability because the large number of issues is impractical to implement even in a large portfolio like ours and, in the case of corporate bonds, inadequate liquidity for some issues
 - For predominantly interest rate sensitive investments we propose continuing the use of the Bloomberg Barclay's Agg because it is the most widely recognized index and analytical services for risk management are readily available for it
 - For credit investments, we recommend retaining the S&P/LSTA Leveraged Loan Index plus a spread of 250 bp. This is the current index for private debt and we believe this index is a representative barometer of credit risk in the market particularly as it is floating rate and not generally subject to interest rate risk. The 250 bp spread reflects the illiquidity of private market debt opportunities, the area of the credit markets that we perceive to have the best total return opportunities.
- We recommend retaining ODCE as the real estate index
 - ODCE was introduced about 10 years ago as a correction to the absence of an investable index in real estate and it has become the leading benchmark for institutional real estate investors
 - It consists of the market cap weighted net returns of about 20 institutional grade open end funds

Benchmarks are not model portfolios

- While benchmarks are investable we do not necessarily intend to replicate them in our portfolios
- In some cases, our portfolios will be different from the benchmarks and tracking error should be expected
 - The current equities portfolio varies from its benchmark through index selection, geographic weight and factor implementation
 - The current credit portfolio varies from its benchmark through focus on direct lending and distressed strategies
 - The current real estate varies from its benchmark through sector and life cycle strategies
- In order to enhance returns, we will manage our positions relative to benchmarks based on risk factors unique to each portfolio and opportunities as they evolve through time
- These strategies to manage relative to benchmarks will be reviewed on an ongoing basis and documented in implementation plans updated at least annually
- We will document in advance the strategies we are following, will state an expected outperformance from the strategies we pursue and will report whether or not this is achieved

Asset Allocation Methodology

- While there are many theories and debates about how to best analytically derive a portfolio structure, we will use here mean variance optimization (“MVO”) which is the traditional asset allocation methodology for investors like ASRS
- MVO considers the expected returns of multiple assets and their covariance in order to find a portfolio which has optimizes the trade off between returns and the volatility of those returns since, other things equal, we would prefer a portfolio with less volatility
- MVO is normally implemented with constraints in order to ensure adequate diversification and because, without them, MVO may produce highly skewed portfolios oriented toward assets with higher expected returns and/or very low correlation to other assets
- In a companion report, our consultant has provided an MVO analysis of the recommended asset allocation which is shown on the following slide

Asset Allocation and Benchmark Policy

Asset Allocation

	Target	Low	High	Benchmark
Equities	50	35	65	ACWI-IMI
Real Estate	20	10	30	ODCE net
Credit	20	10	30	S&P/LSTA+250
Interest Rate Sensitive Bonds	10	0	20	Bloomberg Barclays Ag
Other	0	0	10	Investment Specific
Cash	0	0	5	90 day TBill

Notes:

- Transition Rule – during the buildout phase for real estate and credit, any underweight in these asset classes will be allocated ratably to equities (83.3%) and interest rate sensitive bonds (16.7%)
- SIP002 (Tactical Positioning and Rebalancing) will govern the management of asset weights within ranges
- Multi-asset derivative strategies may be included in the “Other” portfolio or may be implemented as alpha overlays in the equity portfolio, but to the extent implemented as an overlay this will reduce the availability for investment in the Other category

Under the transition rule, the initial allocation will be approximately 60% to equities and 12% to core bonds resulting in a reasonably smooth transition compared to the current allocation

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Risk is the fundamental driver of returns

- In order to make money, you have to take risk
- In this section, we will explore in some detail what we mean by this and how we intend to manage risk in our portfolio
- Fundamentally, risk is a process, activity or exposure that generates returns
 - Risk necessarily entails the possibility of loss, otherwise there would be no reward
 - We will talk about volatility more in a moment, but fluctuations in value aren't what we mean here
 - Though hard to define precisely, we intend by risk to refer to the possibility of gains and losses that in some sense “stick”
- Risk is multi-dimensional
 - Risk means different things to different people, but the complexity in understanding risk goes beyond that
 - As we will outline below, there are different parameters of risk simultaneously impacting a portfolio and providing opportunity to generate returns

Business risk

- We find it useful to think of risk significantly in terms of business risk, i.e.
 - The ability of companies to successfully sell products and manage their operations
 - The ability of properties to attract tenants
 - The ability of borrowers to repay their loans when we extend them credit
- While much of financial theory deals with abstractions of risk derived from statistical analysis of returns
 - It is very important to keep in mind that business risk (along with economic risks discussed in coming slides) is what underlies the statistics
- By and large we embrace business risk in an effort to profit from it
 - We mitigate business risk through owning highly diversified global portfolios
 - We engage in diligence when we are taking idiosyncratic business risk

Economic Cycles

- The economy, business cycle and capital markets dynamics also are a source of risk
 - The economy has ups and downs creating risks and opportunities
 - Economic retractions are a source of risk, particularly for enterprises lacking resources to ride out a recession
 - Unanticipated inflation is a risk for fixed rate investments and for businesses which may need time to adjust to changing prices
 - When investors seek safety during a recession this causes the prices of risky assets to decline, particularly if stressed or illiquid parties become compelled sellers
 - This is a source of opportunity for investors who are long term oriented and have the resources and fortitude to take advantage of these opportunities
- Like business risk, the risk of economic cycles is hard to avoid and a risk we are consciously taking in pursuit of returns
 - Again we reduce this risk through diversification
 - Global diversification reduces cycle risk because the world's economies, while linked, do not always move together

Inflation

- Unanticipated inflation impacts portfolios
 - It is especially harmful to fixed interest rate securities
 - Although the risk of inflation is one of the main drives of term premium
 - The majority of our credit portfolio is held in variable rate instruments which are far less sensitive to inflation
 - It also tends to be harmful in the near term to equities
 - But inflation may occur in times of high demand for goods and services which tends to benefit equities
 - Over time companies can adjust prices to mitigate inflation's impact, though the impact of inflation varies by industry with winners and losers
 - Real estate is often considered a safe haven for inflation risk
 - Over time rents can be adjusted with inflation
 - Real estate is a hard asset whose value is linked to its reproduction cost
- We mitigate inflation risk but cannot entirely avoid it
 - Only a small portion of the portfolio (around 10%) is in fixed interest rate securities
 - The preponderance of the credit portfolio is in variable rate debt
 - The remainder of the portfolio is invested in companies and properties that, over time, can adjust to inflation

Idiosyncratic Risk and Agency Risk

- While listed markets generally are liquid and efficient enough to arbitrage away any diversifiable idiosyncratic risk, private markets operate differently because
 - Information is widely and cheaply available in liquid markets, while information is expensive and often proprietary in private markets
 - Private market investors undertake proprietary due diligence prior to an investment giving them an information edge
- Diligence and information advantages
 - We diligize asset managers to assess their skill, process discipline and organizational depth
 - When investing directly in companies or properties, we focus on business planning and strategy
 - We invest in companies or properties with a plan in mind and generate value by executing that plan
 - We diligize markets to assess the appropriateness of plans
 - Requires long term orientation and control over management
 - Often requires specialized expertise in markets or processes
- Alignment of interest and avoidance of agency costs
 - The nature of private markets provides investors with control rights that are typically unavailable to public market investors such as board control for private equity investors and financial covenants for private debt lenders
 - Compensation structures are put in place to align the interests of all parties.
- Collectively, these strategies allow us to pursue idiosyncratic business risk and profit potential in private markets

Styles and Risk Factors

- In liquid markets, there is strong evidence of risk factors driving performance
- Fama and French demonstrate the influence of size and value on stock performance in their research from the early 1990's
 - Additional research demonstrates additional factors such as low volatility and momentum
- These can be implemented in long only market portfolios
 - ASRS allocates 25% its equity portfolio to a risk factor portfolio equally weighted among size, value, low-volatility and momentum risk factors
- Risk factors can also be implemented in long/short portfolios across multiple markets
 - In general, the goal of such strategies is to create a return stream driven by the pure risk factors
 - It's worth noting that the original Fama French hypothesis was structured as a long short portfolio, so these implementations are well-founded in theory
 - Investable directly (in the "other" category) or as an overlay to traditional beta
 - By structuring in this way, ASRS intends to invest in such strategies only if they are accretive to total fund returns

Volatility as risk

- We've noted that we define risk as a position, strategy or process that generates returns
- While much of modern portfolio theory treats volatility as a proxy for risk, more recent research calls to doubt whether volatility is a driver of returns
 - If volatility were a driver of returns, increasing volatility should increase returns
 - While volatility does seem positively connected to expected returns across asset classes (especially between equities and bonds), the same relationship doesn't seem to hold within asset classes
 - In fact, the relationship seems to be negative and our risk factor portfolio overweights low volatility stocks in a strategy which is intended to earn *above market* returns
- ASRS is relatively indifferent to volatility in devising its investment strategy
 - As a long term investor, we ride out market declines and attempt to profit from them through rebalancing and tactical positioning

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Liquidity

- ASRS needs liquidity to pay benefits and to buy investments
- The net cash flow requirement to pay benefits is approximately \$1 billion per year which is less than a 3% draw on assets
 - Based on current holdings, assets of the ASRS with daily liquidity are more than 20 times the required annual amount
 - Although ASRS does not have and we do not propose a current income target for the portfolio, the current income of the portfolio from dividends, interest and rent is approximately equal to the cash requirement and, if desired, the benefits could be paid from that income without requiring the sale of assets
- The much more important reason for liquidity is to make sure cash is available to buy assets when they are cheap
 - The challenge is that assets, while not perfectly correlated, often move together through the cycle and may tend to become more correlated during a down cycle
 - If the goal is to buy assets when they are cheap (and it is), then you need money to do that
 - This is one of the core functions of an interest rate sensitive portfolio which will tend to hold its value and may increase in value in a recession
 - These assets are desired in a downturn and retain a high degree of liquidity making them a perfect holding to fund asset purchases during tough times
 - For this reason, our proposed asset allocation allows this asset class to be drawn down all the way to zero

Liquidity as Price Discovery

- While we tend to use the word liquidity referring to the ease with which an asset can be turned to cash, much of the theoretical literature focuses on price discovery as the measure of liquidity
- In this sense, assets traded continuously on exchanges are considered liquid because the prices are readily observable in a large number of arms length transactions
- In order to trade assets on an exchange they must be homogeneous and traded under standard contractual terms
 - Such assets are sometimes called “financialized”
 - Owners of assets like this can simply observe the market to estimate the value of their holdings
- The prices of non-financialized assets, such as controlling interests in companies or even single family homes, are determined in negotiations typically requiring the buyer to engage in diligence and often are traded in custom negotiated contracts
 - Owners of assets like this need to conduct periodic appraisals comparing the assets owned to different assets that have traded and making adjustments for differences in order to estimate value
- Our view is that neither type of asset or method of determining value is inherently better than the other
 - But they are different and analytical methods need to take that in to account
 - Caution needs to be exercised to avoid inferring too much diversification benefit from assets valued with appraisals

Liquidity of Assets

- Stocks, bonds, currency and their derivatives have daily liquidity with settlement dates typically one to three days after trade
 - The liquidity of individual securities varies considerably with some securities trading much less frequently than others and incurring higher costs of trading
 - This is particularly true of smaller cap stocks and certain classes of bonds
- Real estate is liquid typically in the span of months with the ability to obtain multiple bids in a short time through an orderly marketing process
 - High quality real estate in major markets is in demand and is more liquid than other real estate
 - Real estate valuations go up and down with the economic cycle and the availability of credit for buyers
- Privately held companies are a difficult asset to transact
 - The transactions require extensive due diligence and intense legal negotiations
 - Valuations are susceptible to the economic cycle and the availability of credit for buyers

Liquidity of Structures

- The structure for owning an asset affects its liquidity
 - For example, if you own stocks and bonds through a hedge fund you may be precluded from accessing those assets due to lock ups, gating periods or redemption limitations, notwithstanding the underlying liquidity of the assets
- The preferred structure for owning most assets is through a “separate account” in which the assets of the investor are segregated with liquidity control features in favor of the investor
 - We hold stocks and bonds predominantly through this type of structure
 - Our private debt program and real estate program predominantly through this type of structure
- We hold some assets in commingled accounts when it is the most viable option for the strategy
 - “Open end” funds allow investors to withdraw capital in quarterly windows at market prices. We use these structures in real estate to access properties not available to us in separate account format because of their size
 - “Closed end” funds lock up the investor’s capital for periods typically exceeding 10 years. We restrict their use for real estate and private debt but allow them for private equity where they are the only viable implementation methodology
 - “Co-investments” are low fee investments made alongside a fund, typically offered because the size of the investment exceeds the available capital or diversification requirements of the fund. The investor liquidity in these investments is controlled by the sponsor, but the hold periods are typically three to five years.

Liquidity as Risk

- Liquidity is often cited as a market “risk factor”, meaning the market provides compensation to those willing to be less liquid
- ASRS seeks to profit from this in multiple ways
 - In general, ASRS need for ready cash is low and reasonably predictable
 - So, we are in a position to be a “liquidity provider” to people who prefer or need to own the most highly liquid assets
- In stock and bond markets, we can own less liquid securities and can structure trading activities within risk parameters to provide liquidity
 - This happens around changes to the components of equity indices
 - We are also exploring how to approach this more generally through trading operations
- We also participate in private markets
 - It is believed that a portion of the return in these markets is compensation for illiquidity
 - We suspect this effect is small and that the larger driver of returns in these markets are idiosyncratic business risks of individual assets
- The incremental return from liquidity is small and captured within the outperformance expectations of individual asset classes

Liquidity Policy

Liquidity Constraints

- Stock, bond and currency exposures in structures with daily liquidity and settlement no later than five business days from notice to sell will not be less than 40% of the total portfolio
- Within equities, investment structures with lockups may not exceed 20% of the equity portfolio and private equity co-investments may not exceed 10% of the equity portfolio
- Within credit, investment structures with lockups may not exceed 30% of the credit portfolio
- Within real estate, investment structures with lockups may not exceed 30% of the real estate portfolio (following transition from legacy portfolio currently in liquidation)
- In the event of non-compliance with any of these liquidity constraints, a report will be delivered to the investment committee describing the circumstances and outlining a plan to prudently return to compliance without requiring distressed sale of assets
- This report does not require the approval of the investment committee
- A “lockup” agreement is one where either of the following is true: (a) ASRS has an unfunded and non-terminable investment commitment excluding commitments for continuing funding for deals already closed and/or (b) ASRS has no right to direct an orderly liquidation, initiate a buy/sell arrangement or, in the case of credit, run-off of the portfolio. Generally, closed end funds will be considered locked-up throughout their term. Lockups with less than one year remaining will not count toward the limitation.

Leverage

- Imagine running a business or living your life without credit
 - You'd need to carry cash around and could only buy something if you had enough cash on hand
 - If you own a business and there is a downturn, you might want to buy a struggling competitor to get its assets cheaply and increase market share
 - But you probably wouldn't be able to do that without credit
- ASRS has historically used leverage inside its portfolios, but not at total fund level
 - Virtually all funds similar to ASRS use leverage inside their portfolios
 - Fund level leverage is less common, although Canadian plans and some large US plans employ it as part of their strategy
- For ASRS, inability to use fund level leverage means
 - We need to devote significant resources to cash management (about one FTE) because of the daily need to raise or invest cash
 - We incur unneeded transaction costs and often are a price taker in trading because our timing is compelled by cash requirements
 - We carry higher cash balances which negatively impacts portfolio returns
- In the context of rebalancing or tactical positioning, ASRS currently has to sell assets in order to buy assets
 - Bridging transactions with debt can lead to better execution
 - In market downturns, leverage creates tactical flexibility to buy assets when they are cheap
- For these reasons, we believe it is prudent to allow a modest amount of leverage as part of our portfolio management toolkit

Leverage in Theory

- Avoiding leverage is not based in theory
- The underpinnings of modern finance presume levered portfolios
 - Modern portfolio theory hypothesizes the existing of a “tangency portfolio” which, combined with cash or leverage, is an optimal portfolio for all investors
 - Fama and French in their three factor model built their theory around long short “market neutral” portfolios
 - Indeed, “leverage aversion” is viewed as a market inefficiency that can lead to asset distortions
- Our view is that leverage is just another kind of risk that should not be categorically ruled out, but should be managed as part of a total program

Leverage – Strategic Use

- ASRS and virtually all similar funds currently has leverage in its portfolio
- Stocks and private equity holdings are levered at an average of around 60% loan to value
- .Private credit and real estate are levered at up to 60% loan to value

Leverage – Operational Use

- We propose operational use of leverage to optimize cash, avoid trading frictions and reduce time spent on cash management
- Cash management has been a challenge for ASRS
 - Since the global financial crisis, the average cash drag on the portfolio has been around 10bp per year
 - Even with improvement from cash assetization adopted in 2016, the cash drag was still negative at 15 bp due to futures cost and mismatch
 - Cash management is time consuming – although our annual cash flows are quite predictable, at a daily scale they are quite volatile with flows of over \$100 million occurring on many days
 - If we assetize, the process has both tracking error due to unavailability of contracts that match our SAA and often return drag from roll costs
 - If we invest short term cash flows, we are exposed to round trip transaction costs
- We believe maintaining credit lines with typical balances outstanding equal to around 1% of fund assets would have multiple benefits
 - It turns cash operations in to a source of returns because the rates for a borrower in our position will be quite low and well below the expected SAA return
 - It will allow us to trade less frequently and much more effectively, allowing us to trade patiently accumulating liquidity premiums rather than paying them
 - It will free investment team time to pursue higher value activities than short term cash management
- We believe that this approach will produce a positive return of an additional 3bp to 5bp to total fund compared to a negative return under the current approach

Leverage – Tactical Use

- Although we establish a target leverage of 1%, we propose allowing up to 5% leverage on total fund to allow us to implement tactical strategies to buy assets at favorable valuations
- This allows us to rebalance a portfolio to SAA targets in down markets where it may be very difficult, and likely inadvisable, to sell less liquid assets to fund stock market purchases
- Additionally, it allows continuation of strategic relationships in private debt and real estate through down turns allowing those ventures to acquire assets at the most favorable times
- The leverage would be returned to target levels through asset sales in favorable markets
- The leverage can be implemented through borrowing or synthetically through futures

Leverage Policy

Leverage Constraints

- Real estate and credit is targeted for leverage up to 60% on a portfolio basis
- Interest rate sensitive bonds will not be levered
- Fund level leverage is targeted for 1% with a low of 0% and maximum of 5%
- Should any of these leverage targets be exceeded a report will be delivered to the investment committee outlining the circumstances and stating a plan to prudently return the portfolio to compliance without requiring sale of assets in distressed circumstances
- The forgoing plans do not require the approval of the investment committee

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Overview

Implementation Plans Requirement

- Every asset class will have an implementation plan approved by the asset class committee
- Implementation plans will be reviewed and updated annually or more frequently at the request of the asset class committee
- The CIO and Investment Consultant will report annually to the investment committee on the implementation plans and their expected returns
- Each implementation plan will include
 - the near term strategy for the assets including goals ensuring portfolios are well diversified and expected performance from the strategies relative to benchmark
 - A review of the prior year plan and whether the outperformance goals were achieved
 - any sub-allocations or benchmarks for internal performance measurement (but not modifying the overall SAA benchmarks)
 - means of compliance with the SAA including liquidity and leverage constraints
 - structures for implementing the plan including separate accounts, commingled funds, ETFs, etc

Equities

- The initial implementation plan will mimic the current implementation of equities through S&P, EAFE and EM indices and EDHEC factor implementations
- Approximately 50% of equities will be managed internally
 - Active management has been discontinued
- The outperformance targets are
 - Index Selection 10bp
 - Enhanced index strategies (75% of portfolio) 10bp
 - Factor Strategies (25% of portfolio) 50bp
 - Securities Lending 5bp
 - Weighted average 35bp
- It is anticipated that up to 20% of the equity portfolio may be overlaid with an alpha enhancement strategy
 - Such a strategy is expected to have low correlation to equities and may be based on long/short strategies across multiple liquid asset types
 - Equities are selected for this strategy because the allocation to equities is large allowing implementation of this strategy without reducing tactical allocation flexibility and because low cost futures are available facilitating implementation of the strategy
 - Any such overlay will be implemented with liquid assets, available liquidity not less than quarterly and initial lockups not greater than two years
 - If implemented, this would be targeted to add another 25bp to 50bp of performance to the portfolio

Real Estate

- Real estate has been operating under implementation plans for the last 5 years and no change in the current process is proposed
- The current implementation plans provide for diversification of assets across property types, markets and project life cycle
- The real estate program is implemented through a series of strategic relationships with market and product specialists structured as separate accounts
- It is anticipated that the real estate portfolio will grow gradually with an extremely disciplined approach taking, perhaps, five to ten years to reach its target allocation
- The historic outperformance of the current real estate strategy has been over 450bp per year (excluding legacy investments pursued under a different strategy)
- The ASRS strategy is differentiated from the ODCE benchmark which reflects core stabilized assets while the ASRS strategy invests across the property life cycle with about 45% leverage compared 22% in the benchmark
- We believe continuing outperformance of 100bp per year is an appropriate expectation

Credit

- It is anticipated that credit investments will continue to be implemented consistent with the current investments which are a combination of high yield bonds, private debt and distressed credit investments
- The average outperformance in this strategy has historically been over 200 bp per annum
- We believe continuing outperformance of 100bp per year is an appropriate expectation

Interest Rate Sensitive Bonds

- It is anticipated that that investments in Interest Rate Sensitive Bonds will continue to be implemented consistent with current investments in the Bloomberg Barclays U.S. Aggregate Bond Index, which represents the US investment-grade fixed income market including US Treasuries and Agencies, Agency Mortgage-Backed Securities, Corporate Bonds, Commercial Mortgage-Backed Securities (CMBS) and Asset-Backed Securities (ABS)
- The average outperformance in this strategy has historically been about 30 bp per annum
- We believe continuing outperformance of 15bp per year is an appropriate expectation including securities lending

Cash

- It is anticipated that current program of assetizing cash to a blend of stock and bond positions through futures contracts will be continued
- The amount of cash is expected to be much smaller
- As previously noted, historic cash drag has been around 10bp per year
- Under this new approach, we believe zero effect on total fund is a reasonable expectation

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House Views

- We monitor markets considering
 - valuations relative to historic norms
 - relative valuation across asset classes
 - relative valuation of currency and global interest rates
 - trends and momentum
- We document this analytical work in “house views” which are the basis for tactical decisions to overweight or underweight certain asset classes
- A tactical positioning committee meets monthly (or more frequently if necessary) to review and implement tactical decisions

Rebalance and Tactical Positioning

- The “long run” is a series of “short runs”
- As a long term investor, we are not a static “buy and hold” investor
- Rather, we continuously engage in rebalancing and tactically positioning our portfolio
- While there is generally considered to be a premium for rebalancing, that is built in to our benchmark
 - Our benchmark is calculated as though the portfolio could be costlessly and perfectly rebalanced on a monthly basis
 - Research shows that this adds around 50bp per year to long run performance
- ASRS needs to have an effective rebalance program to keep up with this and overcome transaction costs
- ASRS accomplishes outperformance by effective tactical positioning considering house views and cost consciousness in avoiding excessive or high cost trading
- ASRS has historically achieved around 40bp in outperformance from rebalancing and tactical positioning
- We believe continued outperformance of approximately 25bp per year is a reasonable expectation

Outline

- 1 Introduction
- 2 Assets
- 3 Strategy
 - Risk
 - Risk Limitations
 - Asset Class Implementation Plans
 - Tactical Management
- 4 Process**
 - Planning
 - Value Creation Processes
 - Governance and Monitoring
- 5 Summary

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Plans and Hierarchy of Plans

- Plans add value by encouraging strategic thought and tactical activity
- Plans help organizations be more effective by focusing effort and improving coordination
- This document establishes three levels of planning
 - Long range strategic planning focused on broad asset allocation as a foundation for returns which are expected to be enhanced by strategy and processes articulated in the plan
 - Annual implementation plans that focus efforts based on current market context and most recent research
 - House views that guide tactical activities in rebalancing and positioning the portfolio based on immediate market circumstances

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Research and Strategy Formation

- The portfolio managers are experts in the markets they cover
- They are responsible to monitor market conditions and identify opportunities for attractive investment based capital markets dynamics, regulatory dislocations and other factors leading to mispricing of risk
- When a strategy for potential investment is identified, the portfolio managers and CIO concur on a plan for research and diligence which, following the completion of additional due diligence by an outside consultant and approval by an internal asset class committee, may culminate in the deployment of capital
- We remain current in financial markets research as a source of ideas for portfolio implementation
- We conduct ongoing event studies and simulations as a source of ideas for trading implementation in our internal portfolios

Diligence

- We engage in diligence in an effort to find the best partners and business opportunities
- In private markets we seek an information advantage through diligence
- When our portfolio managers identify an opportunity
 - we engage in an outbound process to find the best counterparties to pursue the opportunity
 - we analyze their track record with state of the art statistical methods
 - we perform diligence on operational, organizational and legal matters to confirm integrity in the implementation and conduct of the business strategy
 - outside consultants are required and always utilized as a key part of the diligence effort

Performance Measurement and Feedback

- We view performance measurement and feedback as an active part of our investment process and not a mere administrative activity
- Performance measurement adds value because you can only improve if you are candid with yourself about what you are good at and where you need to improve
- In order to create the highest value from performance measurement, the most advanced statistical methods are needed
 - We implement both returns and holdings based analysis
 - and we are able to present that over varying time frames and rolling periods in order to understand trends

Cost Management

- Costs matter and we are highly cognizant of costs in managing the investment program
 - We manage approximately one third of our assets internally at effectively zero cost
 - The remainder of public market assets are managed with custom negotiated vehicle and fee structures
- Private market investments are generally implemented in strategies involving highly specialized expertise
 - We need to acquire talent to pursue these strategies and cost minimization is not the objective
 - We pursue high return on investment on any fees we pay
 - by first diligizing managers and only negotiating with the most highly qualified among them, and
 - by structuring competitive negotiations among these managers
 - By implementing our private markets investment program largely through separate accounts, we implement in much larger account sizes which facilitates favorable negotiation of fees

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Governance

- ASRS has been a leader in establishing robust governance with clear delineation of authority
- The board governance manual in combination with strategic investment policies and the investment policy statement provides a clear framework for investment management
- At the operational level numerous standard operating procedures are in place to guide day to day activities

Reporting

- ASRS has established a comprehensive reporting mechanism for internal use and to keep the board and the public well informed on its investing activities
- These reports encompass every aspect of the investment operation and include
 - The annual investment report included as part of the comprehensive annual financial report
 - Quarterly and monthly performance evaluations
 - Holdings and returns based attribution analysis for public market investments
 - Public market equivalent benchmarking for private market assets
 - Daily portfolio positioning reports

Compliance

- ASRS has established a comprehensive system for oversight and compliance
- Every trade in public markets is validated by a third party for compliance with the investment strategy and statutory requirements
- All private market investments receive confirmatory diligence from a third party consultant
- An independent consultant monitors asset class committee meetings to confirm compliance with policy
- Assets are held by a custodian and returns are calculated by an independent consultants
- Financial statements are audited by an independent auditor

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Summary

- In this document, we have articulated broad asset allocation and investment strategies
- By approving this plan the following is accomplished:
 - Asset allocation targets, ranges and benchmarks are established
 - Liquidity requirements and constraints are established
 - Leverage constraints are established
 - Requirements for annual asset implementation plans are established