# Investment Board Meeting Agenda

Wednesday, September 25, 2024
IPERS Board Room
Conference Telephone #: 312-626-6799
Meeting ID: 882 2486 2797
1:00 p.m. – 3:45 p.m.

**1:00 p.m.** **Call to Order**

**1:05 p.m.** **Investment Board Governance and Fiduciary Training**
Cynthia Lande & Caleb Brus, *BrownWinick Law*

**2:30 p.m.** **Break**

**2:45 p.m.** **Asset Allocation Education and Assumptions Update**
Thomas Toth and Ned McGuire, W*ilshire*

**3:30 p.m.** **Absolute Return Strategies**
John Fujiwara and Sheldon Lien, *IPERS*

**3:45 p.m.** **Adjourn**

# BROWNWINICK LAW

Be Bold. Be Wise.

# Investment Board Governance and Fiduciary Training

September 2024

Cindy Lande & Caleb Brus

# Agenda

# Agenda

- Legal Standards
- IPERS Structure and Governance
- Fiduciary Duties
- Best Practices
- Hypotheticals
- Q&A

# Legal Standards

# Legal Standards

- Internal Revenue Code
- Iowa Code Chapter 97B
- Iowa Trust Code – Chapter 633A
- Employee Retirement Income Security Act (ERISA)

# IPERS Structure and Governance

# IPERS Governance

- IPERS is an independent state agency under the Executive Branch of state government
- Member assets are held in the IPERS trust
- IPERS agency administers the IPERS trust

# Key Roles

- Settlor: State of Iowa
  - The Iowa Legislature sets the terms of the plan (Iowa Code Chapter 97B) and level of benefits available to the members

# Key Roles (Continued)

- CEO/Staff
  - The CEO is appointed by the Governor and confirmed by the Senate
  - The CEO serves as the Administrator for the plan, a fiduciary role
    - In this role, the CEO is primarily responsible for carrying out the duties and responsibilities of the System not assigned to others
    - The CEO may delegate fiduciary and administrative responsibilities to other staff and outside service providers
  - The CEO is responsible for setting the budget for the system, in consultation with the Investment Board and other staff

# Key Roles (Continued)

- Budgeting and Expenditures
  - Chapter 97B authorizes the system to spend system funds on
    - Benefit payments
    - Administrative expenses
    - Investment expenses
  - Historically, the System's administrative budget (including internal investment staff salaries) have been approved by the Iowa Legislature, but investment expenses have not

# Key Roles (Continued)

- CEO/Staff (Continued)
  - Other fiduciary staff functions include:
    - Security of member personal information
    - Prudent asset management
    - Calculating, approving, and paying benefits
    - Auditing and assisting with corrections to employer contributions
    - *Retirement benefit counseling*
    - *Member education*

# Key Roles (Continued)

- Investment Board
  - Investment Board members are fiduciaries of the plan and trustees of the IPERS trust
  - Statutory duties:
    - Set investment policy and approve hiring of external investment managers
    - Set funding policy
    - Advise the CEO on budgeting and the hiring and salary of the Chief Investment Officer
    - Set actuarial assumptions and adopt mortality tables
    - Approve the hiring of the System's investment consultant and actuary
    - Complete the CEO's performance evaluation and set the CEO's salary within the state salary system

# Key Roles (Continued)

- Benefits Advisory Committee
  - The statutory duty of the Benefits Advisory Committee is to evaluate and make recommendations regarding member services and benefit structure to IPERS and the Iowa Legislature

# Fiduciary Duties

# What is a Fiduciary?

- A fiduciary is a person who has a duty to act with a standard of care and in the best interest of another
- A trustee is a fiduciary
- While certain titles convey a fiduciary status, title alone does not dictate whether someone is a fiduciary

# IPERS Fiduciaries

- Chief Executive Officer
- Investment Board
- Chief Investment Officer
- Chief Benefits Officer
- Treasurer of the State of Iowa (as Custodian)
- System staff and other state employees who have control over or the ability to direct the use of System assets

# Fiduciary Duties

- Duty of Care (Prudence)
- Duty of Loyalty
- Duty of Diversification
- Duty to Follow the Terms of the Plan Document

# Duty of Care (Prudence)

- The “prudent person” standard is the universal standard of fiduciary conduct
- Fiduciaries must act with the care, skill, prudence, and diligence that a prudent person would use in similar circumstances

# Duty of Loyalty

- The duty of loyalty requires fiduciaries to act solely in the best interest of plan participants and beneficiaries
- Fiduciaries must avoid conflicts of interest
- Fiduciaries must not advance their interests, or the interests of others, above the interests of participants and beneficiaries
- Fiduciaries may not favor one group of participants or beneficiaries over another

# Duty of Diversification

- Fiduciaries must diversify plan assets to avoid the risk of large losses unless it is more prudent not to do so

# Duty to Follow the Terms of the Plan Document

- Fiduciaries must follow and administer the plan in accordance with the terms of the plan document (in this case, Iowa Code Chapter 97B)

# Exclusive Benefit Rule

- The Exclusive Benefit Rule is a tax rule
- Qualified plans must exclusively benefit employees or their beneficiaries
- The Exclusive Benefit Rule has the following application to investment of plan assets:
  - The cost of investments must not exceed the fair market value at the time of purchase
  - There must be a fair return on the investment commensurate with the prevailing rate
  - Sufficient liquidity must be maintained in the plan to permit distributions in accordance with the terms of the plan
  - The safeguards and diversity that a "prudent person" would adhere to must be present

# Right of Delegation

- Fiduciaries may delegate duties to investment managers or other professionals
- Delegation does not make a fiduciary any less of a fiduciary
- Fiduciaries retain the duty to monitor those to whom they have delegated responsibilities, and fiduciaries have a duty of reasonable inquiry into the actions of those persons

# IPERS Ethics Policy

- IPERS has developed its own Ethics Policy to detail the fiduciary duties of Investment Board members and employees, which supports statutory requirements of Iowa Code Chapter 68B and other statutory and professional ethics standards
- The IPERS Ethics Policy requires:
  - Honesty in the performance of duties relating to IPERS
  - Loyalty to the interests of IPERS, its members, and its beneficiaries
  - Disclosure and, if possible, curing of conflicts of interest
  - Avoidance of use of position with IPERS for personal gain
  - Confidentiality with respect to confidential System information
  - No solicitation or acceptance of gifts from a restricted donor
  - Compliance with applicable professional standards
  - Personal financial disclosures

# Best Practices

# Best Practices

- Follow a prudent process
- Document decisions
- Know the capacity in which you are making a decision
- Obtain all relevant information when making fiduciary decisions

# Best Practices (Continued)

- Engage experts when appropriate
- When delegating authority, complete a thorough review of appointee, including expertise and fees, and compare to competitors
- Avoid actual conflicts of interest and appearances of conflicts
- Regularly review processes and procedures
- Complete periodic training on activities within each fiduciary's scope of authority

# Hypotheticals

# Questions?

Be Bold. Be Wise. BrownWinick.

Wilshire

# Iowa Public Employees Retirement System

## Asset Allocation Education and Assumptions Update

September 2024

# Risk Assessment Framework

Wilshire's multi-dimensional view of risk integrates organizational and investment considerations into a comprehensive framework for evaluating strategic decisions.

- **Shortfall:** Support distributions and long-term growth
- **Behavioral:** Instill strong governance
- **Drawdown:** Limit portfolio losses
- **Inflation:** Preserve long-term purchasing power
- **Liquidity:** Balance near-term needs, long-term opportunities
- **Active:** Ensure unique exposures

# Risk Tolerance is Multi-Faceted (Checklist Approach)

- ☐ Provide IPERS participants with retirement benefits
- ☐ Improve funded status of the plan for the sole purpose of providing benefits
- ☐ Generate a return that meets the 7% actuarial rate of return
- ☐ Employ a long term horizon
- ☐ Reduce potential for permanent impairment (drawdown)

# Risk Tolerance is Multi-Faceted (Checklist Approach)

☐ Provide IPERS participants with retirement benefits

- Ensure the portfolio can generate enough liquidity
  - Meet benefit commitments
  - Rebalance the portfolio to maintain specified risk level

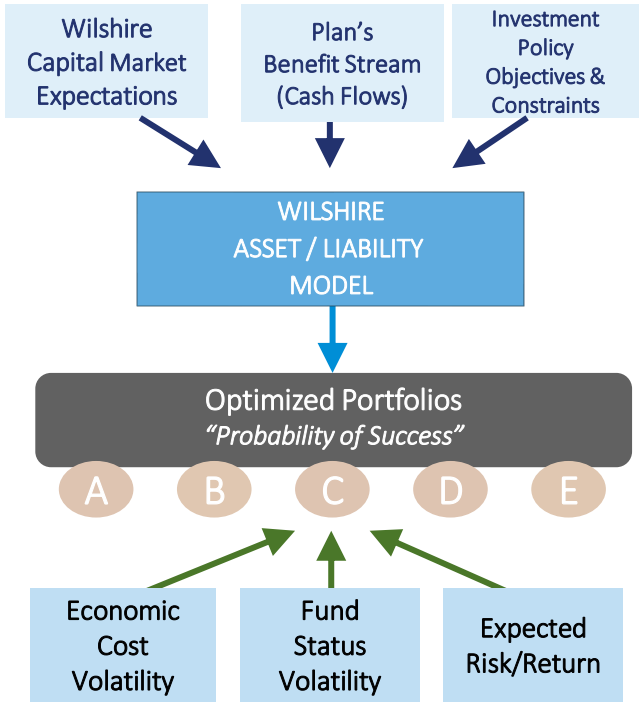
- Utilize Wilshire Liquidity Metric in asset allocation modeling
  - Reflects the tradability of assets during normal and stressed markets
  - Quantified on a scale from 0% (low liquidity) and 100% (high liquidity)
  - Appendix includes more detail on Wilshire methodology

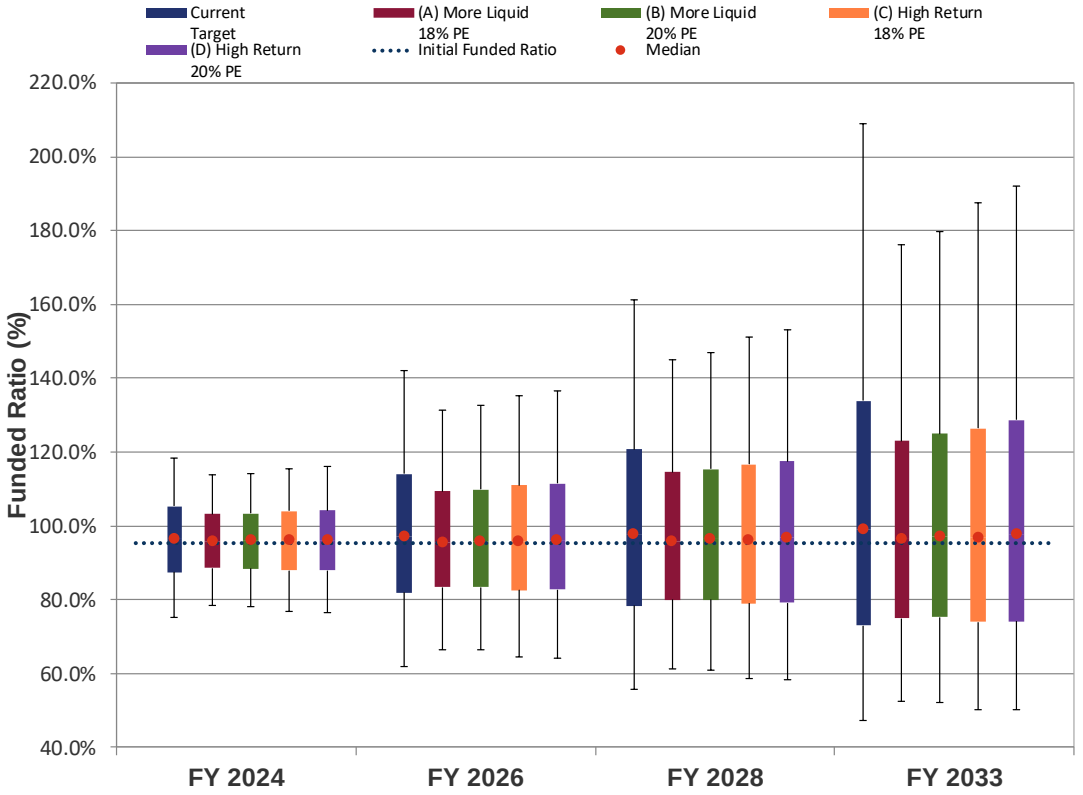
  

# Risk Tolerance is Multi-Faceted (Checklist Approach)

## Improve funded status of the plan for the sole purpose of providing benefits

- Examine volatility under multiple portfolio return scenarios – Sample ALM Output



# Risk Tolerance is Multi-Faceted (Checklist Approach)

☐ Generate a return that meets the 7% actuarial rate of return

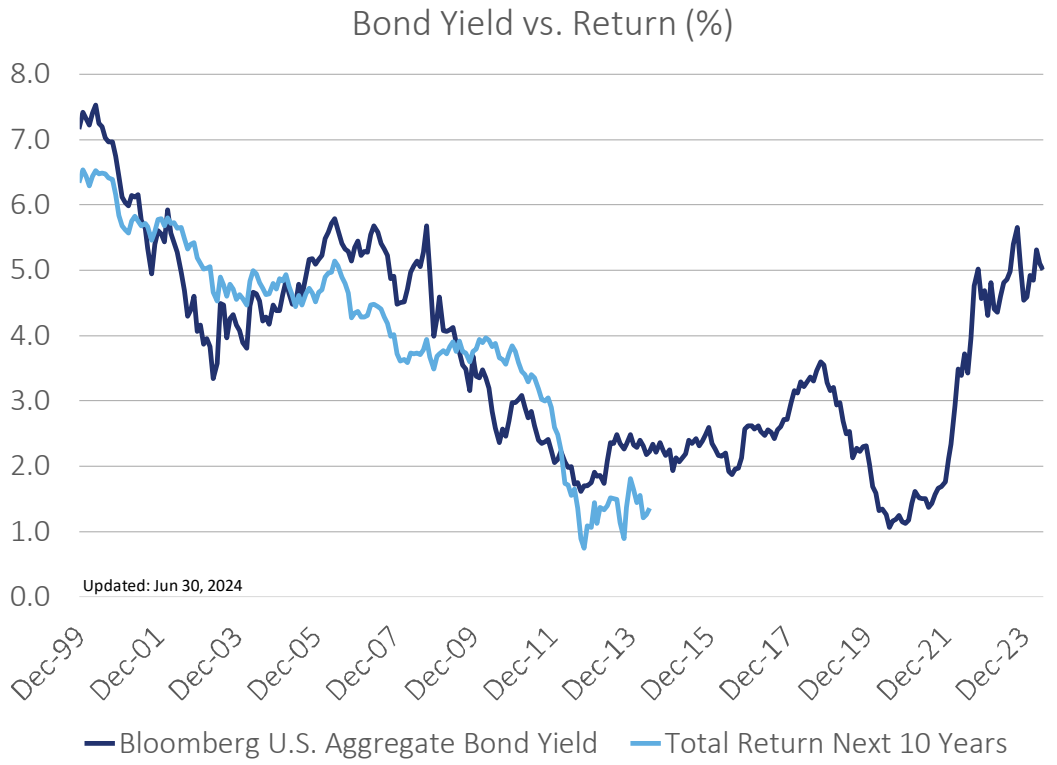
- Evaluate capital market opportunity set using expected return and risk assumptions
  - What has changed in Wilshire capital market assumptions over the last year?

- Given asset class return and risk assumptions, quantitatively and qualitatively evaluate portfolio target weights

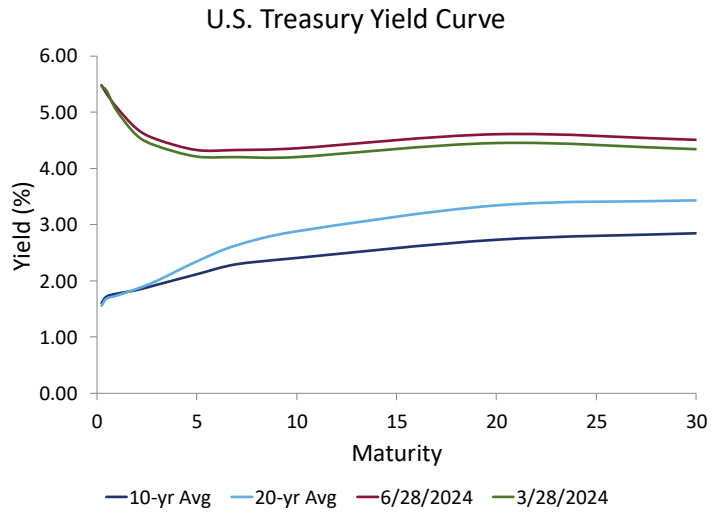
# Fixed Income Model Framework

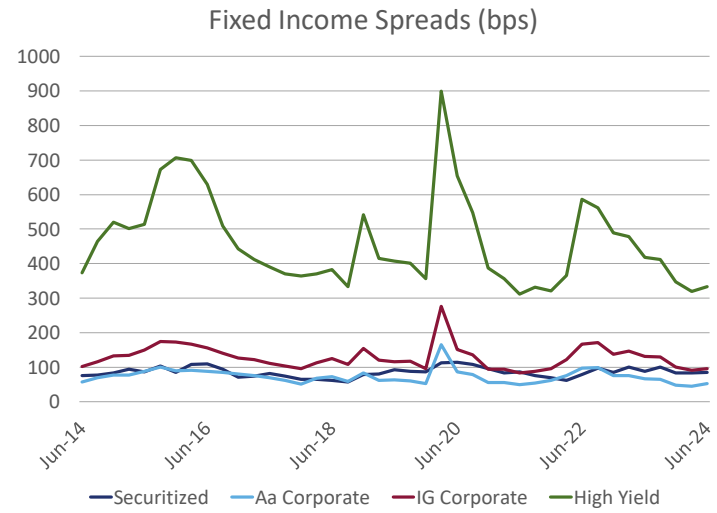
- Forecasting fixed income involves two major components
  - Current Treasury yields and current credit spread levels
  - Expectations for changes in both of those inputs during the next 10 years
- Wilshire's fixed income return assumptions build off key inputs
  - Inflation assumption
  - Current observed yields/spreads, historical relevant relationships and forward yield curve
  - Forecasts for the pace and timing of yield and spread changes
- Current observed maturity and credit risk premiums are normalized to expected levels during our forecast period to calculate fixed income return assumptions




Data Source: Bloomberg

# Fixed Income Update



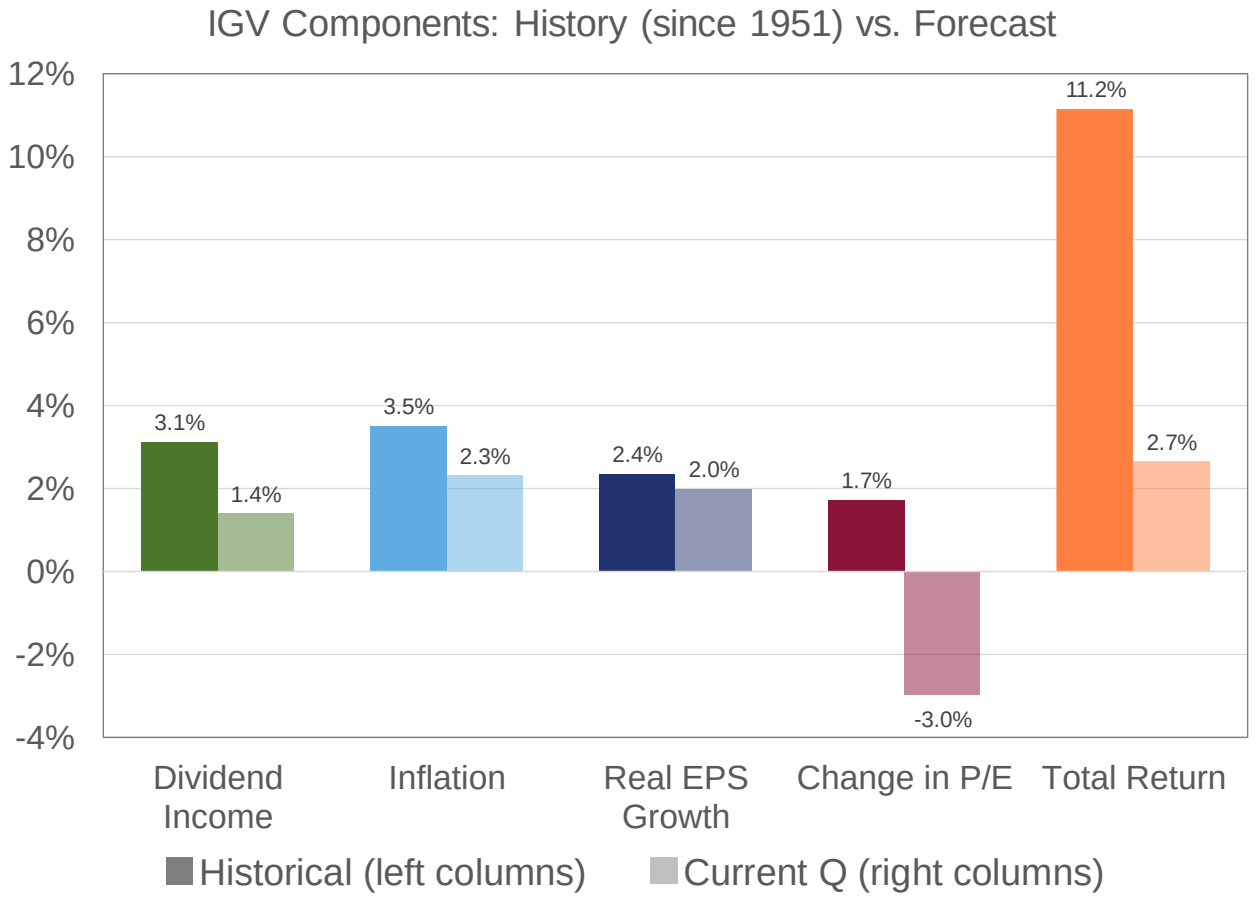

Data Source: Bloomberg

| Inflation & Fixed Income | | Jun 2023 | Change | Jun 2024 |
|---|---|---|---|---|
| Inflation | 10-Year Treasury Yield | 3.84 | 0.56 | 4.40 |
| | 10-Year Real Yield | 1.62 | 0.49 | 2.11 |
| | Breakeven Inflation | 2.22 | 0.07 | 2.29 |
| | **Inflation Forecast** | **2.25** | **0.05** | **2.30** |
| Cash | 91-Day T-Bill Yield | 5.43 | 0.05 | 5.48 |
| | T-Bill Yield in 10 Yrs | 3.50 | 0.25 | 3.75 |
| | **Cash Forecast** | **3.85** | **0.15** | **4.00** |
| Treasury | U.S. Treasury Idx Yield | 4.37 | 0.20 | 4.57 |
| | Treasury Idx Yield in 10 Yrs | 4.40 | 0.55 | 4.95 |
| | **Treasury Idx Forecast** | **4.40** | **0.30** | **4.70** |
| | U.S. LT Treasury Idx Yield | 3.97 | 0.64 | 4.61 |
| | LT Treasury Idx Yield in 10 Yrs | 3.95 | 0.71 | 4.66 |
| | **LT Treasury Idx Forecast** | **4.00** | **0.60** | **4.60** |
| Spread | U.S. Corporate Idx OAS | 1.31 | (0.35) | 0.96 |
| | Corporate Idx OAS in 10 Yrs | 1.53 | (0.00) | 1.53 |
| | **Corporate Idx Forecast** | **5.50** | **0.25** | **5.75** |
| | **U.S. Core Bond Forecast** | **4.85** | **0.40** | **5.25** |
| | **U.S. LT Core Bond Forecast** | **4.80** | **0.40** | **5.20** |
| | U.S. High Yield Idx OAS | 4.17 | (0.84) | 3.33 |
| | High Yield Idx OAS in 10 Yrs | 5.33 | (0.05) | 5.28 |
| | **High Yield Bond Forecast** | **6.20** | **0.30** | **6.50** |

# U.S. Stocks - IGV Model

- Simple (few heroic assumptions) and intuitive

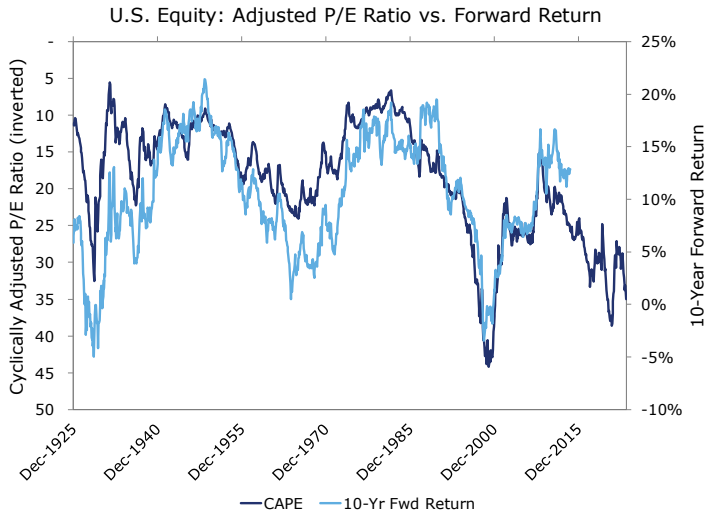
- Clearly separates the drivers of return, focusing questions on return levels
  - If the assumption is “wrong,” where is it off, which return driver
  - And then by how much is it off

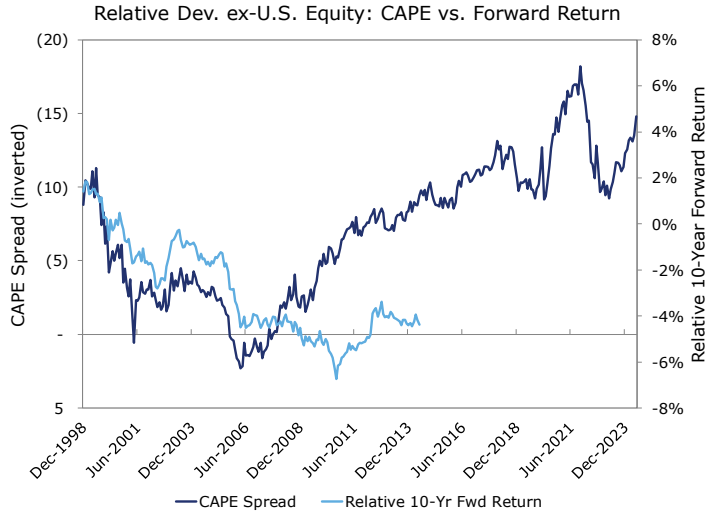



Data Source: Bloomberg

# Equity Markets Update

| Equity: Public & Private | | Jun 2023 | Change | Jun 2024 |
|---|---|---|---|---|
| Equity | DDM | 6.60 | (0.10) | 6.50 |
| | IGV | 4.40 | (1.75) | 2.65 |
| | CAPE | 5.85 | (3.00) | 2.85 |
| | **U.S. Equity Forecast** | **5.50** | **(1.00)** | **4.50** |
| | **Dev-ex-US Equity Forecast** | **6.50** | **(1.00)** | **5.50** |
| | **EM Equity Forecast** | **6.75** | **(1.00)** | **5.75** |
| Private | Cost of Debt (Public) | 5.65 | 0.35 | 6.00 |
| | Cost of Debt (Private) | 7.80 | 0.15 | 7.95 |
| | **Private Market Basket Forecast** | **9.00** | **(1.55)** | **7.45** |




Data Source: Bloomberg

# Private Equity

- Identify and account for all key factors that contribute to the realized return of a buyout or venture capital investment
  - Beta and relative valuation – sensitivity to systematic risk (i.e. public market equity)
  - Financial leverage – adjustments for differences in leverage between public and private markets
  - Illiquidity and operational premiums
  - Fees – base and incentive fees paid to general partners
- Final assumption is compared to a public markets-plus corridor as a reasonableness check – currently equal to public equity assumption + 1.5% (low end) and then + 6%
- Forecast both buyouts (U.S. & Non-U.S.) and venture capital and then combine them to arrive at a "typical," diversified private equity portfolio assumption

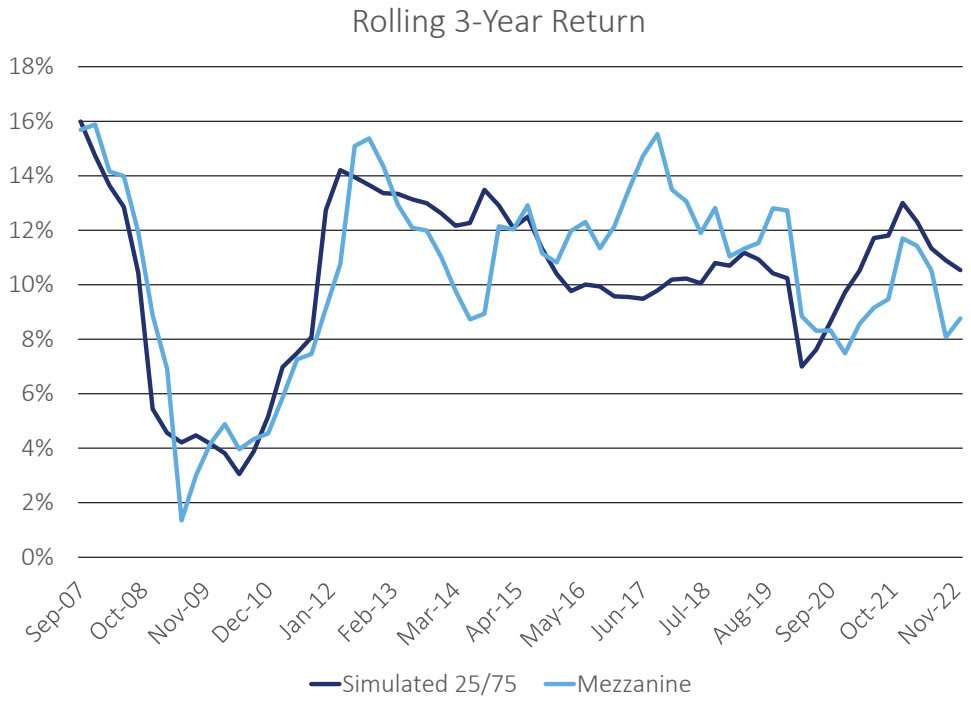
| Market Segment | Assumption |
|---|---|
| U.S. Equity | 4.50% |
| | |
| USE + 1.5% | 6.00% |
| U.S. Buyouts | 6.00% |
| USE + 6% | 10.50% |
| | |
| Non-U.S. Buyouts | 7.00% |
| Global Venture Capital | 7.15% |
| | |
| **Private Equity** | **7.45%** |

# Private Credit

- Direct Lending is a similar asset class to Bank Loans, model accordingly starting with the public security
  - Apply leverage of 50% to Bank Loans assumption
  - Include return premium of 1%, as these borrows have fewer options and so lenders can demand higher coupon rates

- Mezzanine (or Opportunistic) Debt is like a convertible bond sensitive to equity and fixed income betas; proxy assumption based on 25%/75% weighting of U.S. buyouts and direct lending

- Distressed Debt represents issues that are in default; proxy assumption based on 50%/50% weighting of U.S. buyouts and high yield bonds



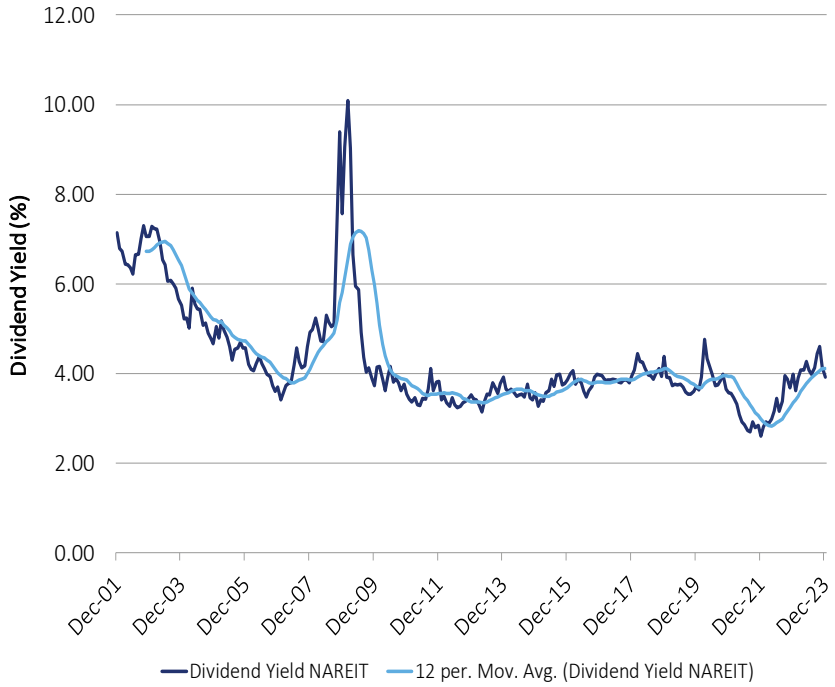

| Market Segment | Basket Weight | Assumption |
|---|---|---|
| Direct Lending | 50% | 8.55% |
| Mezz./Opportunistic | 30% | 7.10% |
| Distressed Debt | 20% | 7.10% |
| | | |
| **Private Credit** | | **8.20%** |

# Real Estate and Real Assets

- REIT assumption based on dividend yield + dividend growth
  - Yields have recently recovered from a substantial drop, equaling 4.13% in June
  - Expected growth equals 75% of Wilshire's 2.30% inflation forecast (1.725%)

- Private real estate takes a similar approach except to include the private market capitalization rate, rather than a market yield

- Infrastructure – public and private
  - Forecast for Global Listed Infrastructure begins with the current yield on the market and assumes an expected dividend growth rate equal to 75% of long-run inflation
  - Private Infrastructure mirrors our private real estate model with two modifications
    - Yields reflective of the infrastructure market
    - Leverage typical of private infrastructure funds




Data Source: Bloomberg

# Modern Portfolio Theory Inputs

Median return

- 50% probability that the return will be higher than expected
- 50% probability that it will be less than expected

Measures the dispersion of the asset class returns around the expected return

- Higher dispersion indicates higher risk – i.e. more uncertainty

Measures the movement of asset class returns in relation to one another

- Lower correlations lead to stronger diversification benefits when assets are combined into a portfolio

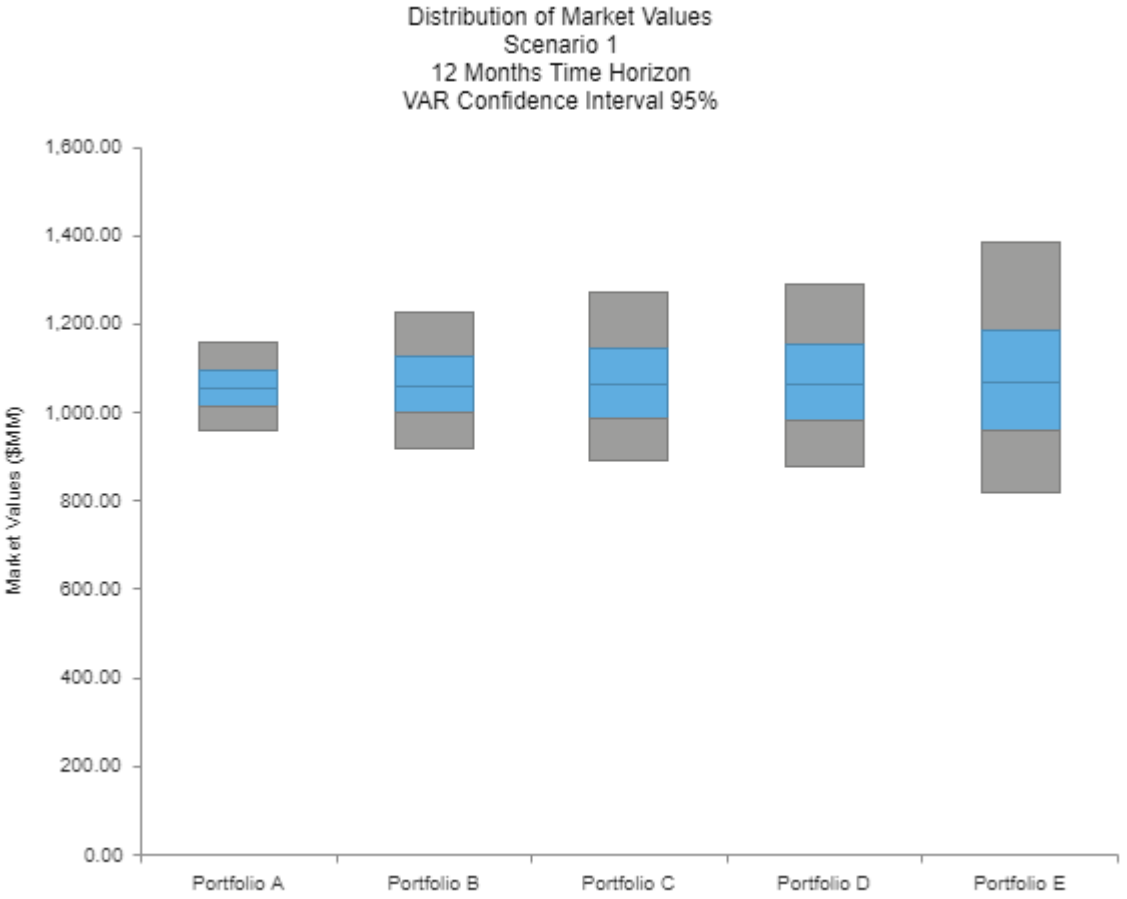

  

# Portfolio Construction Impact on Absolute Risk

Simple portfolio example

- Global Equity, Core Fixed Income, Cash

| Asset | Low Risk - Liquid | Low Risk | Moderate Risk | Match Risk | High Risk |
|---|---|---|---|---|---|
| | Portfolio A | Portfolio B | Portfolio C | Portfolio D | Portfolio E |
| Global Equity | 30 | 50 | 65 | 72 | 100 |
| Core Bonds | 50 | 50 | 35 | 28 | 0 |
| Cash | 20 | 0 | 0 | 0 | 0 |
| Expected Return - 30 years | 5.5 | 6.1 | 6.3 | 6.4 | 6.6 |
| Risk | 6.1 | 9.3 | 11.5 | 12.6 | 17.1 |
| Return/Risk | 0.91 | 0.66 | 0.55 | 0.51 | 0.39 |
| Portfolio Market Values ($MM) | | | | | |
| Percentiles | | | | | |
| 5% | 1,159.0 | 1,225.0 | 1,270.1 | 1,292.0 | 1,384.5 |
| 25% | 1,096.3 | 1,125.5 | 1,143.6 | 1,152.2 | 1,186.6 |
| 50% | 1,054.8 | 1,061.1 | 1,063.2 | 1,064.0 | 1,066.0 |
| 75% | 1,014.8 | 1,000.4 | 988.5 | 982.6 | 957.6 |
| 95% | 960.0 | 919.1 | 890.0 | 876.2 | 820.8 |
| | | | | | |
| Portfolio Returns | | | | | |
| Percentiles | | | | | |
| 5% | 15.9 | 22.5 | 27.0 | 29.2 | 38.5 |
| 25% | 9.6 | 12.6 | 14.4 | 15.2 | 18.7 |
| 50% | 5.5 | 6.1 | 6.3 | 6.4 | 6.6 |
| 75% | 1.5 | 0.0 | -1.2 | -1.7 | -4.2 |
| 95% | -4.0 | -8.1 | -11.0 | -12.4 | -17.9 |



# Risk Tolerance is Multi-Faceted (Checklist Approach)

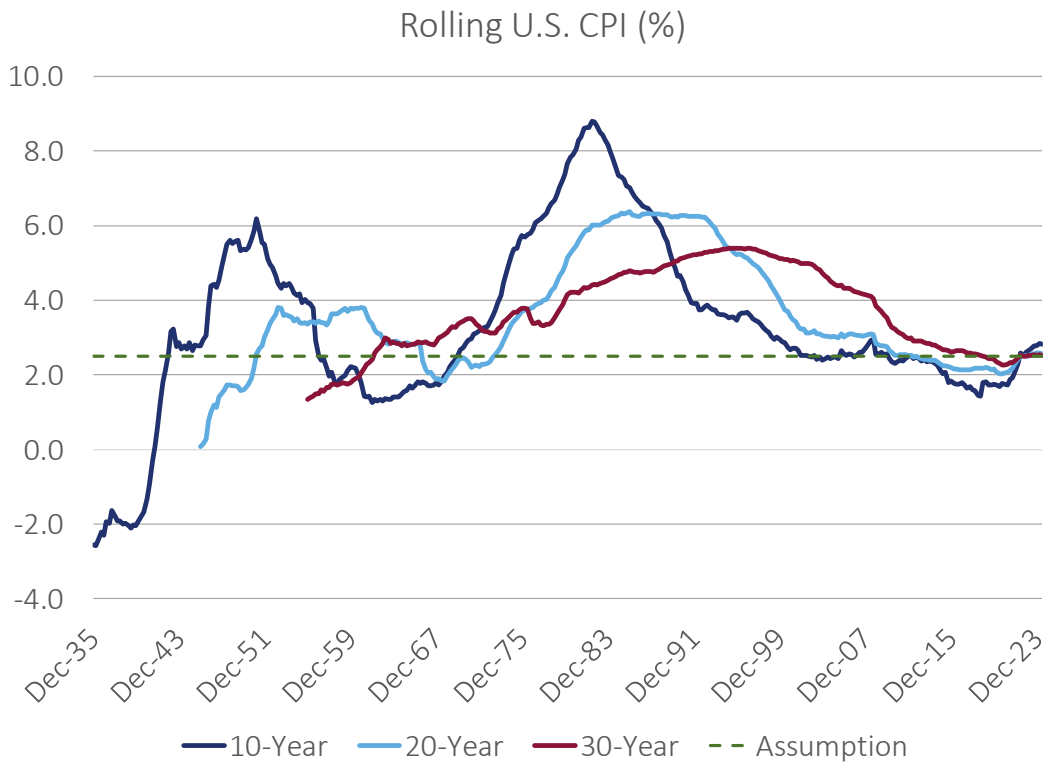
## ☐ Employ a long term horizon

- Wilshire has created equilibrium expected return assumptions based on long term risk premiums
  - Baseline drivers of return – inflation and real cash yield
  - Add building blocks of fixed income returns
  - Examine historical relationships to riskier assets
  - Combine equilibrium assumptions with standard 10-year forecasts for longer-term expectations

# Inflation Assumption

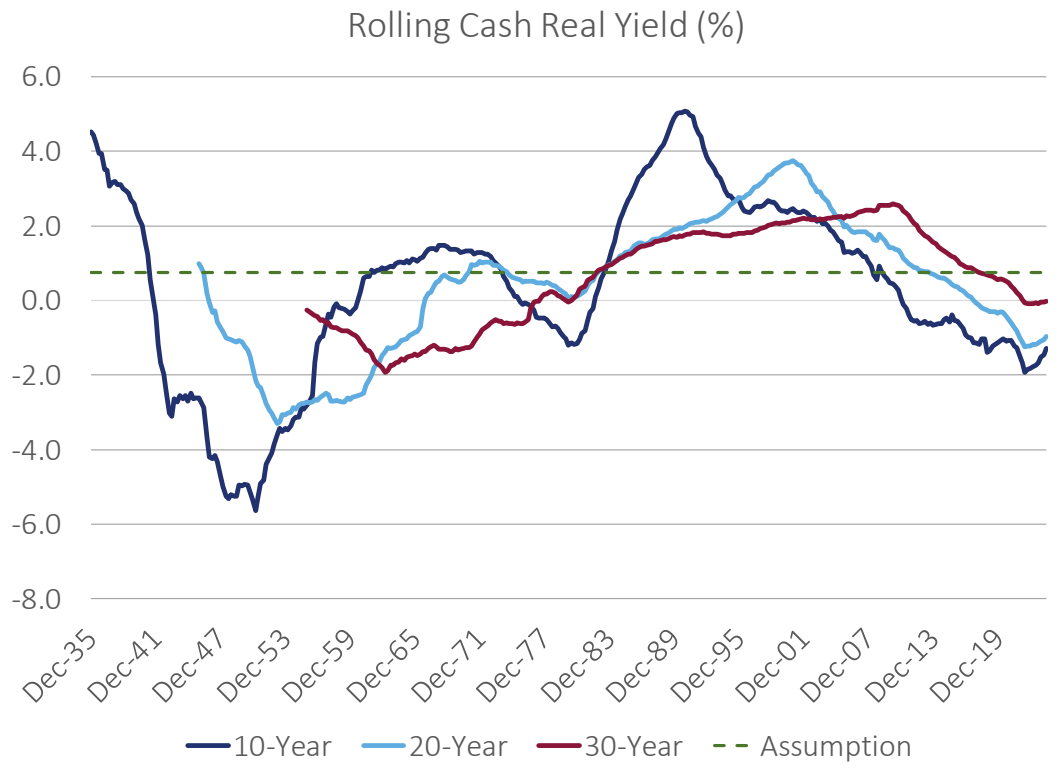
- Post-WWII, U.S. inflation has equaled 3.5%, annualized
- 30-year breakeven is available and has averaged 2.2% since inception (26 years of history)
- Equilibrium inflation assumption of 2.50% provides a cushion versus the Fed's 2% target and the historical long-term breakeven




Data Source: Bloomberg

# Real Yield on Cash

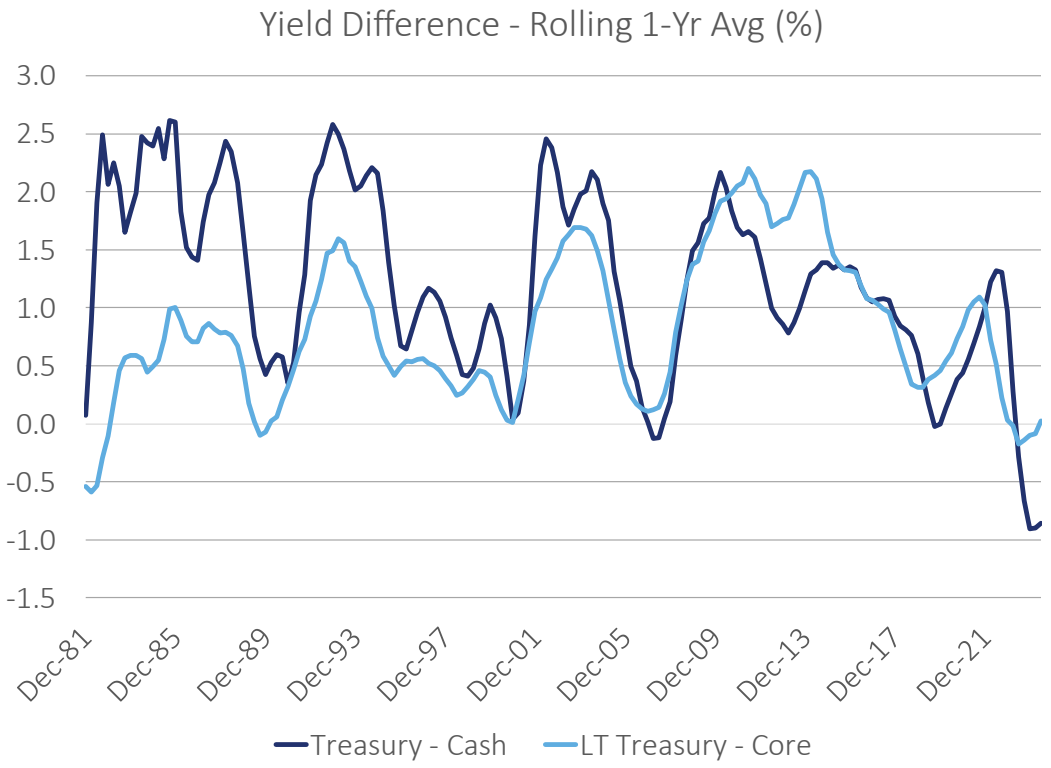
- Historical average real yield for 30-year periods is 0.7%, median is 0.8%
- Since 1982, Wilshire's annual real cash assumption has averaged 0.7%
- However, before short-term rates went to zero in 2008, the average was 1%
- Equilibrium real cash assumption of 0.75% is within a reasonable range of historical observations while de-emphasizing the large negative real yield environment during the 1940's




Data Source: Bloomberg

# Fixed Income Building Blocks: Duration

- Duration premium is collected for extending time to maturity
- Measure duration premium as additional yield per unit of duration, versus cash
- Premium is then multiplied by the duration of the index in question to arrive at a premium for that market segment
- Methodology utilizes two steps, a premium for the short-to-intermediate portion of the curve and one for the long-end to account for the typical shape of the curve




Data Source: Bloomberg

# Fixed Income Building Blocks: Credit

- Credit premium is collected for investing in quality segments below Treasuries

- Utilize a High Yield bond index to measure the credit premium
  - Start with the spread on the index
  - Account for defaults by subtracting a net default rate from the spread
  - Divide this "net yield" by the original spread to get a premium per unit of risk

- Final equilibrium fixed income assumption is then simply summed; core bond example is shown to the right

- In practice, build assumptions at the segment level (corporate, securitized, etc.) and market weight for the core assumption

Core Bond Equilibrium Assumption

| | |
|---|---|
| Inflation | 2.50% |
| Real Cash | 0.75% |
| Duration | 1.25% |
| Credit | 0.30% |
| Equilibrium Return | 4.80% |

# Equity Asset Classes

- Utilize Wilshire's Income + Growth + Valuation model (IGV) to forecast an equilibrium return for public equity
  - Historical real growth of 2.00% added to inflation forecast of 2.50% (**G**)
  - Expectation for a very long time horizon, i.e. an equilibrium state, for contribution from valuation changes is 0% (**V**)
  - Assumptions for E/P and a Payout Ratio (E/P * Payout) based on history suggests an income return of 3.2% (**I**)

- Private Equity is then assumed to earn an additional 3% above public equity, split between Buyouts (+1.5%) and Venture Capital (+1.5%)
- Private Credit is a combination of the underlying market segments, following our building-block approach for 10-year assumptions

U.S. Equity Equilibrium Assumption

| | |
|---|---|
| Income | 3.20% |
| Real Growth | 2.00% |
| Inflation | 2.50% |
| Valuation | 0.00% |
| Compounded Return | 7.90% |

# Beyond Stocks and Bonds

- Utilize historical yield and/or return differences to establish equilibrium inputs that can be used with our assumption methodologies

- REITs provide an example of the general process
  - Historical difference between REIT and bond yields averages 0.5%
  - Add that spread to equilibrium core bond yield to establish a yield on REITs
  - Our standing methodology for forecasting REIT returns is then utilized and results in an equilibrium REIT return assumption of 7.20%

- Process utilizes the basic return building blocks that have been identified to forecast returns further out on the risk spectrum

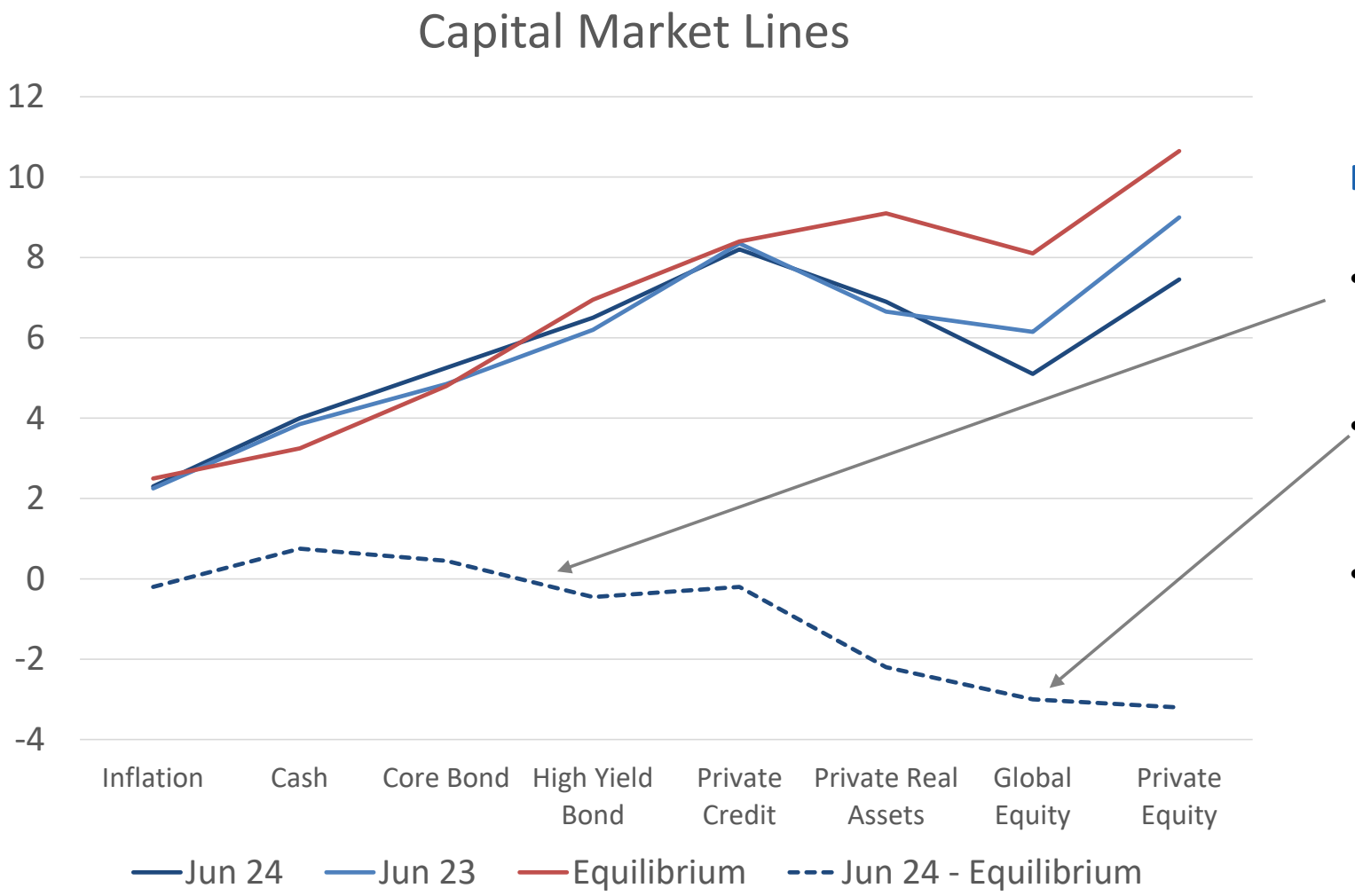
# Returns as Far as the Eye Can See

- Equilibrium numbers can be linked to the 10-year forecasts to provide extended periods
- Reflects current market conditions and any qualitative adjustments that are made during our quarterly process
- Equilibrium-state assumptions will not be updated on an on-going basis; however, we will continue to monitor them to ensure the building blocks of return are being accurately captured

| Asset Class | 10-Year | 30-Year | Equilibrium |
|---|---|---|---|
| US Stock | 4.50 | 6.20 | 7.90 |
| Dev ex-US Stock (USD) | 5.50 | 6.70 | 7.90 |
| Emerging Mkt Stock | 5.75 | 6.85 | 7.90 |
| Private Equity | 7.45 | 9.05 | 10.65 |
| Cash Equivalents | 4.00 | 3.65 | 3.25 |
| Core Bond | 5.25 | 5.05 | 4.80 |
| LT Core Bond | 5.20 | 5.65 | 6.05 |
| TIPS | 4.60 | 4.75 | 4.85 |
| High Yield Bond | 6.50 | 6.75 | 6.95 |
| US RE Securities | 5.85 | 6.55 | 7.20 |
| Private Real Estate | 6.25 | 7.10 | 7.95 |
| Commodities | 6.30 | 6.05 | 5.75 |
| Inflation (CPI) | 2.30 | 2.40 | 2.50 |

# 10-Year Expected Returns vs. Equilibrium

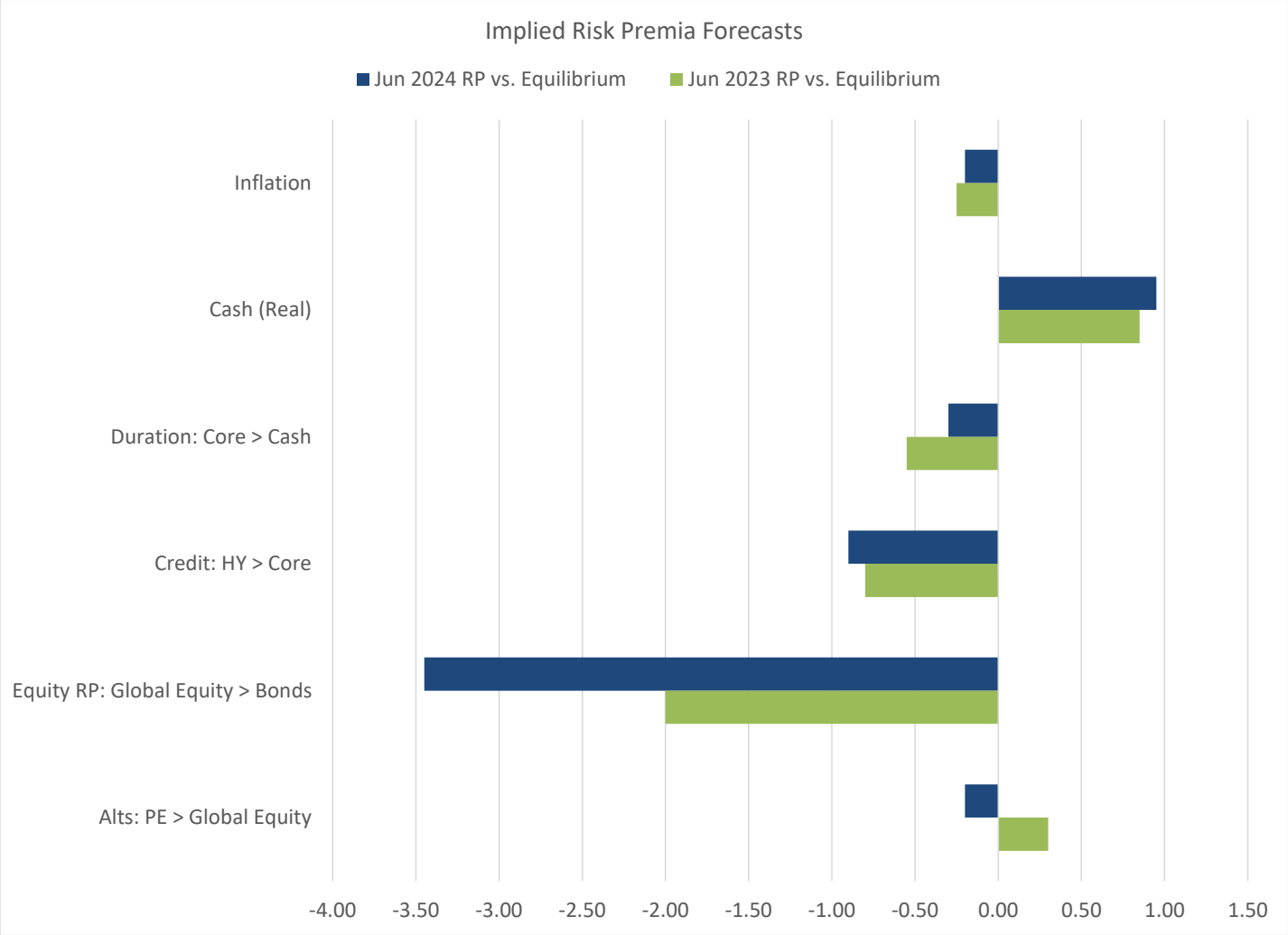



## Equilibrium vs. Current: June 2024

- Fixed Income: expected returns are at or above Equilibrium for most strategies
- Negative Equity Risk Premium: below average compensation for taking public equity risk
- Expected returns support a more conservative approach

# 10-Year Expected Returns vs. Equilibrium




## Equilibrium vs. June 2024 and June 2023

- Real return on cash higher than equilibrium expectations
- Compensation for taking duration/credit risk is lower than equilibrium
- Public equity risk premium is farther below equilibrium expectations
- Private equity risk premium over public equity is more compressed relative to June 2023

# Risk Tolerance is Multi-Faceted (Checklist Approach)

☐ Reduce potential for permanent impairment (drawdown)

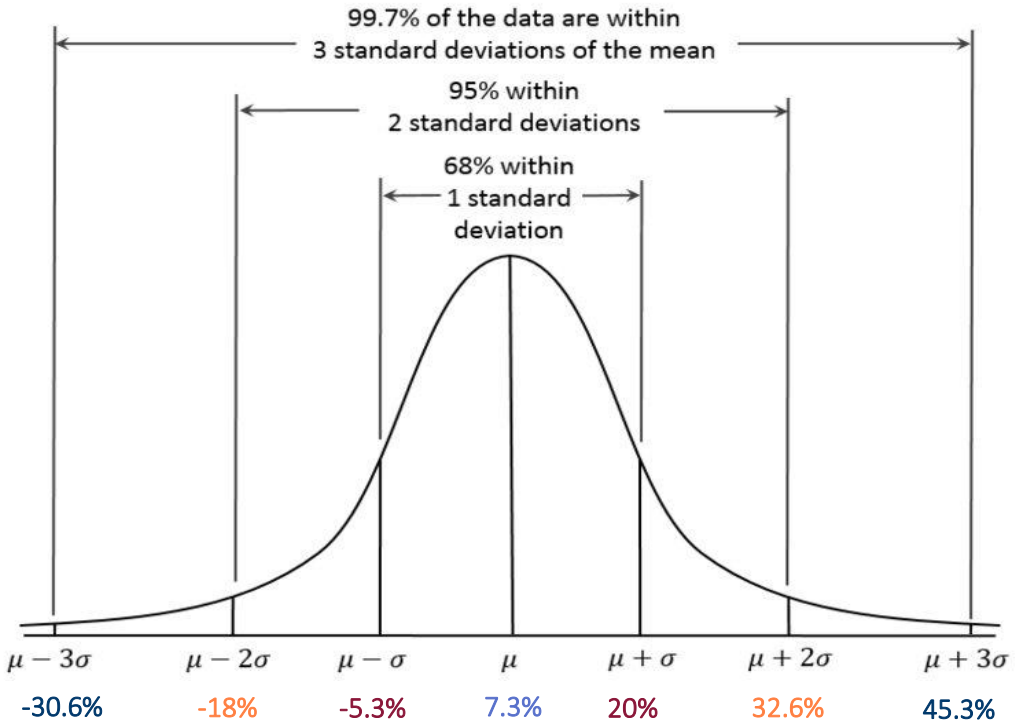
- Drawdowns are most impactful to decreasing funded status and increasing contribution rates

- Conditional Drawdown at Risk (CDaR) is a metric to compare portfolio downside profile

# Standard Deviation – Absolute Risk

- The forward looking expected standard deviation of the IPERS asset allocation policy is 12.64% (June 2024 assumptions) with a median 30-year return of 7.3%
- National Average = 12.1% standard deviation
- What Does This Mean?



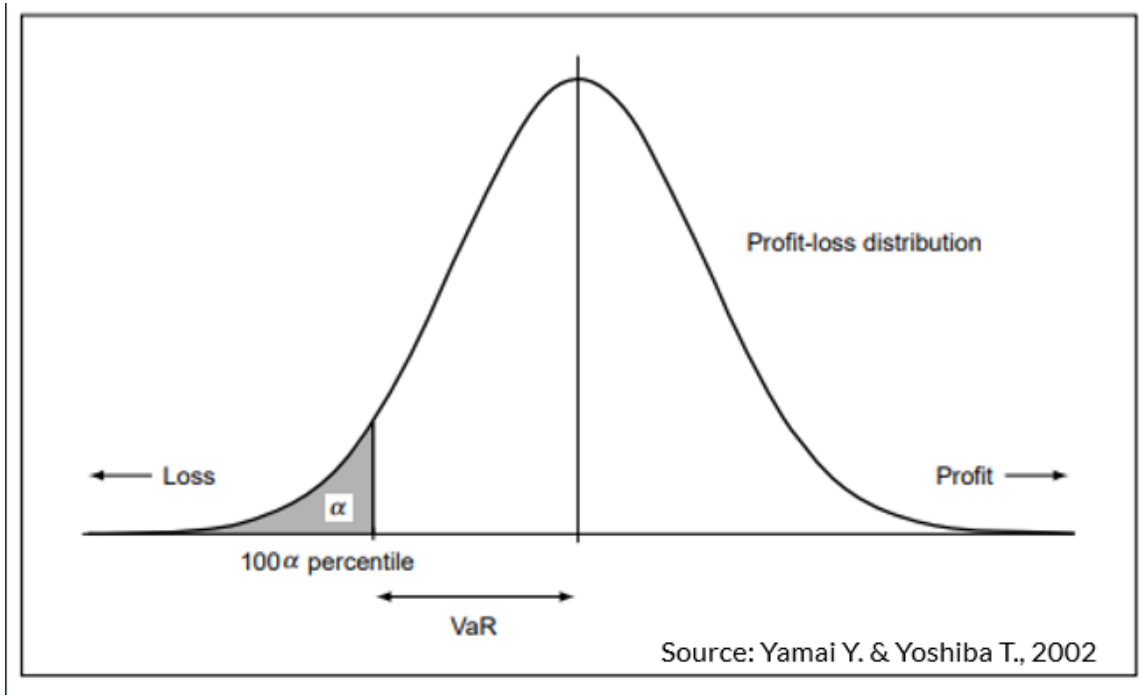

- Statistically, 68% of the time the 1-year return is expected to be within +/- 1 standard deviation of 7.3% or between -5.3% and 20%
- 95% of the time the return should be within +/- 2 standard deviations of 7.3%, or between -18% and 32.6%

*The volatility is measured using expected economic risk, the actual path of returns will likely be smoother because of private asset valuation process

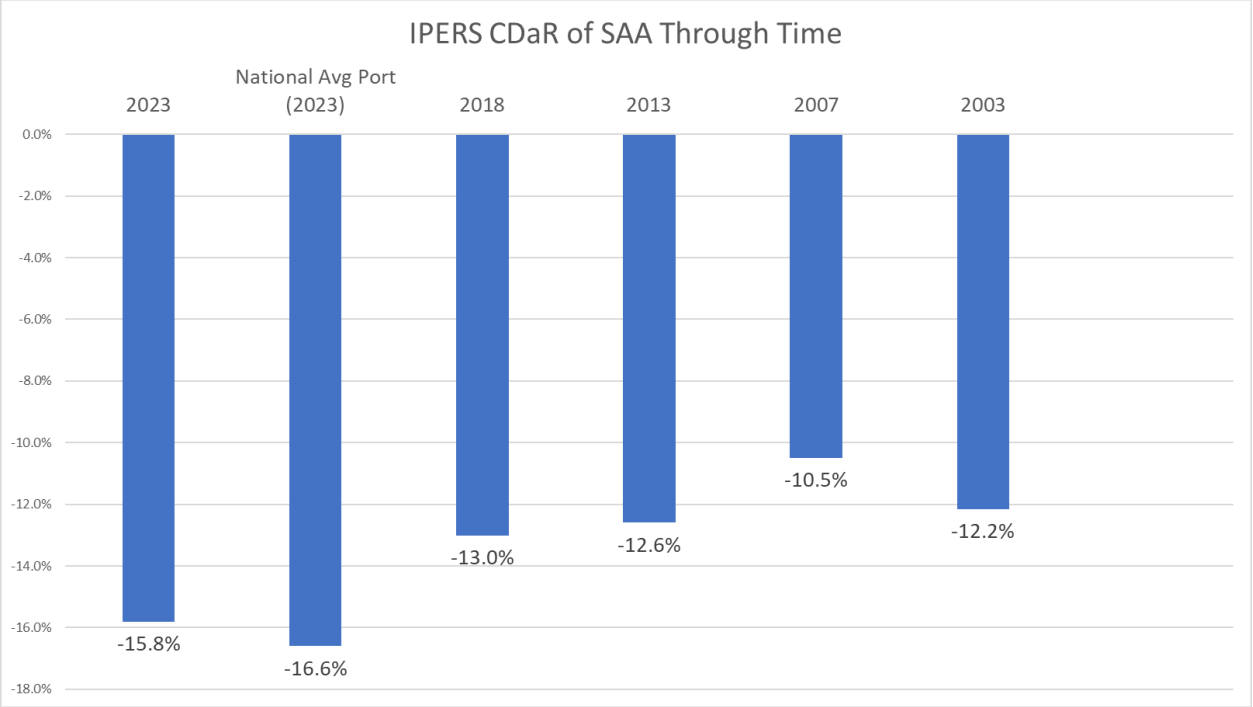
# Defining CDaR (90%) – Conditional Drawdown at Risk

- Standard deviation measures volatility of all gains and losses
- Conditional drawdown measures the average loss of the worst ten percent of projected losses.



# How should board think about the right amount of CDaR?

- Board has inherently accepted various levels of downside risk throughout time when approving portfolios
- Wilshire has modeled historical SAA's to provide context of past expressed "risk appetites"
  - For example using the 2023 SAA: The expected decrease you might experience with 10% probability is -15.8% for a given year
- Board will be provided CDaR of potential new portfolios to compare with current during asset allocation discussion




**National Average Source**: Center for Retirement Research at Boston College, MissionSquare Research Institute, National Association of State Retirement Administrators, and Government Finance Officers Association.

# Conclusion – Asset Allocation and Risk

## Practical challenge of mean-variance optimization

- Estimation error in return, risk and correlation parameters
- Correlations shift during stressed market environments
- Returns are assumed to be normally distributed
- Impractical portfolios generated through optimization

## How can we improve the asset allocation process?

- Incorporate liquidity modeling ✓
- Factor analysis ✓
- Economic regime / Stress Tests ✓
- Evaluate downside distributions – introduce Conditional Drawdown at Risk (CDaR) ✓

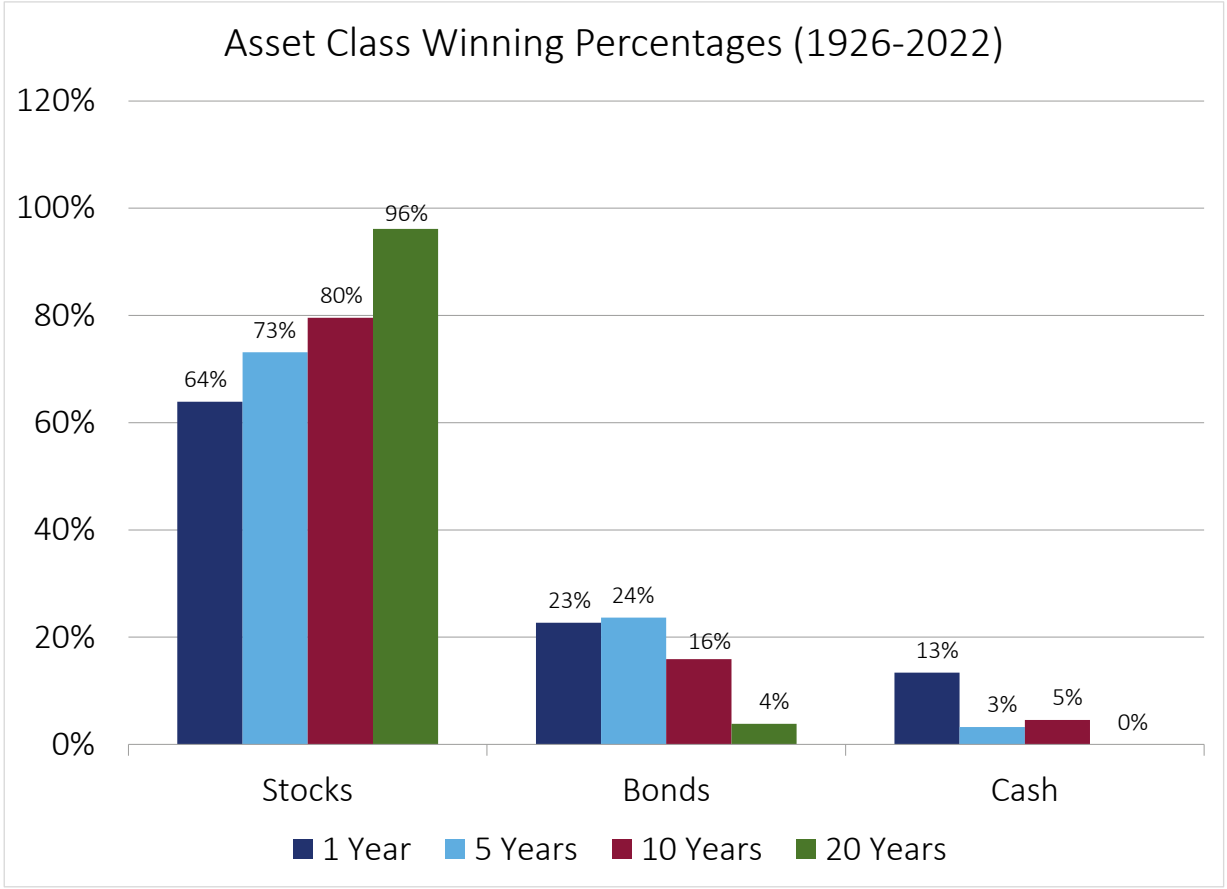
# Appendix: Wilshire Liquidity Model

 | 

# Liquidity Risk: What Are The Consequences?

Default/Insolvency is the most severe outcome from having insufficient liquidity, but…
There are many other, more likely, disruptive impacts that a lack of liquidity can impose on an investment portfolio

- Liquidity breaches can rob an investor of their biggest advantage: a long-term investment horizon
- The timing and price of such sales dictated by liquidity needs rather than by explicit investment rationale
- Can destroy portfolio value and effectively strip a portfolio from its ability to recover from market sell-offs



# Wilshire Liquidity Metric

Wilshire's Liquidity Metric framework has two levels:

- **Market Level of Liquidity**
- **Stressed Level of Liquidity**

## Market Level of Liquidity

- Quantified on scale from 0% (low liquidity) to 100% (high liquidity)
- Designed to capture general notion of marketable versus private/off-market transactions
  - Marketable asset classes typically reflect a 90% or 100%
  - Private asset classes reflect 0%
- Goal is to reflect the tradability of assets, which is helpful in connecting these values back to our definitional framework (i.e., to quantify the differences between Convertible Liquidity and Delayed Liquidity)

# Wilshire Liquidity Metric

## Wilshire's Liquidity Metric framework has two levels:

- **Market Level of Liquidity**
- **Stressed Level of Liquidity**

## Stressed Liquidity Metric

Includes a penalty process to reflect the loss in practical liquidity due to asset class volatility and sensitivity to particular economic environments

Penalty components:

1. Growth Penalty:
   - Impacts asset classes with vulnerability to slowing growth
   - Recognizes the hit to liquidity that can occur during growth related bear markets
2. Inflation Penalty:
   - Impacts asset classes with vulnerability to rising inflation
   - Recognizes the hit to liquidity that can occur during inflation driven bear markets
3. Volatility Penalty:
   - Impacts higher volatility asset classes
   - Recognizes the hit to liquidity that can occur from any form of volatility

# Wilshire Stressed Liquidity Metric

## Stressed Level of Liquidity Metric

| Asset Class | Market Liquidity | Liquidity Penalty Components | | | Applied Penalty | Stressed Liquidity |
|---|---|---|---|---|---|---|
| | | Growth | Inflation | Volatility | | |
| US Equity | 100 | 50 | | 24 | 50 | 0 |
| Dev ex-US Equity | 100 | 50 | | 26 | 50 | 0 |
| EM Equity | 90 | 50 | | 40 | 50 | 0 |
| Private Equity | 0 | 50 | | 40 | 0 | 0 |
| Cash Equivalents | 100 | | | | 0 | 100 |
| Core Bonds | 100 | | 8 | | 8 | 86 |
| High Yield Bonds | 80 | 40 | | 10 | 40 | 0 |
| US Real Estate Securities | 90 | 50 | | 24 | 50 | 0 |
| Private Real Estate | 0 | 50 | | 18 | 0 | 0 |
| Commodities | 90 | | | 20 | 20 | 55 |

Applied Penalty = Min(Max(Growth + Inflation, Volatility), Market Liquidity)

Stressed Liquidity * = Market Liquidity - (1.75 x Applied Penalty)

** If less than 20, Stressed Liquidity is assumed to be 0*

# Factor-based Asset Allocation

# Why Introduce Factors?

**Risk Assessment:** Including factors within the asset allocation process provides an opportunity to measure asset class (and portfolio) exposures to key economic factors

**Economic Efficiency:** If the underlying economic activity that drives asset performance can be identified, perhaps it can be used to assist in building economically-efficient portfolios

**Portfolio Stability:** Macroeconomic risk factors – when separated from the valuation component inherent in investment pricing – may exhibit more stable correlations and, therefore, can better inform the allocation process

# Identifying Key Factors

Ideal factors are the primary economic drivers to which investments respond and should include the following attributes

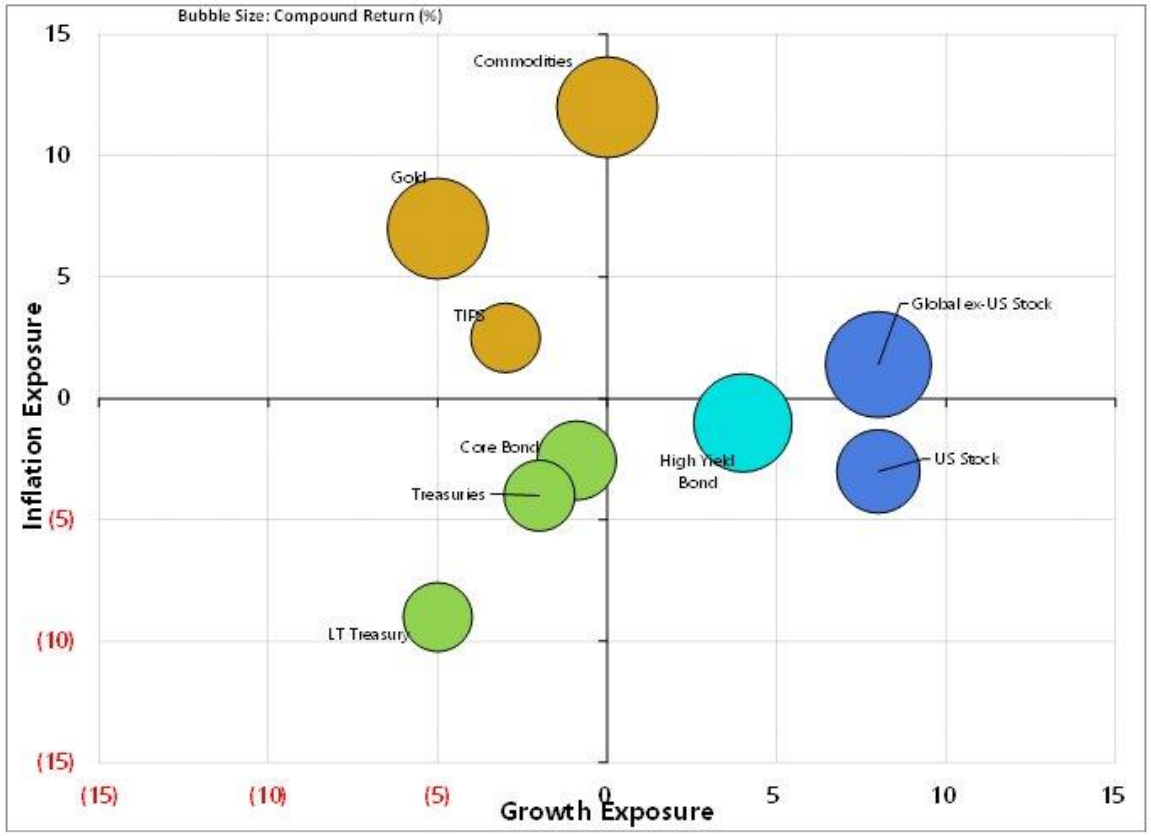
- Relationship with returns is straightforward, intuitive and easily understood
- Explanatory power/statistical value in describing asset class behavior
- Has a low correlation to other factors
- Measurable with reasonable frequency
- Contemporaneous, free from significant timing lags
- Identifying useful factors is challenging:
  - For example, real GDP growth is only measured quarterly, is reported with a lag, is commonly revised and says nothing about future growth expectations
  - Proxy for growth (and other economic drivers) is necessary to attempt to capture various asset classes' sensitivity to growth expectations

# Regression Output – 2-factor Model

- Equities show meaningful exposure (slope) to growth, high quality bonds and gold exhibit negative exposure

- Positive exposure to inflation of TIPS, commodities and gold are intuitive, as are negative exposures of most high-quality bonds

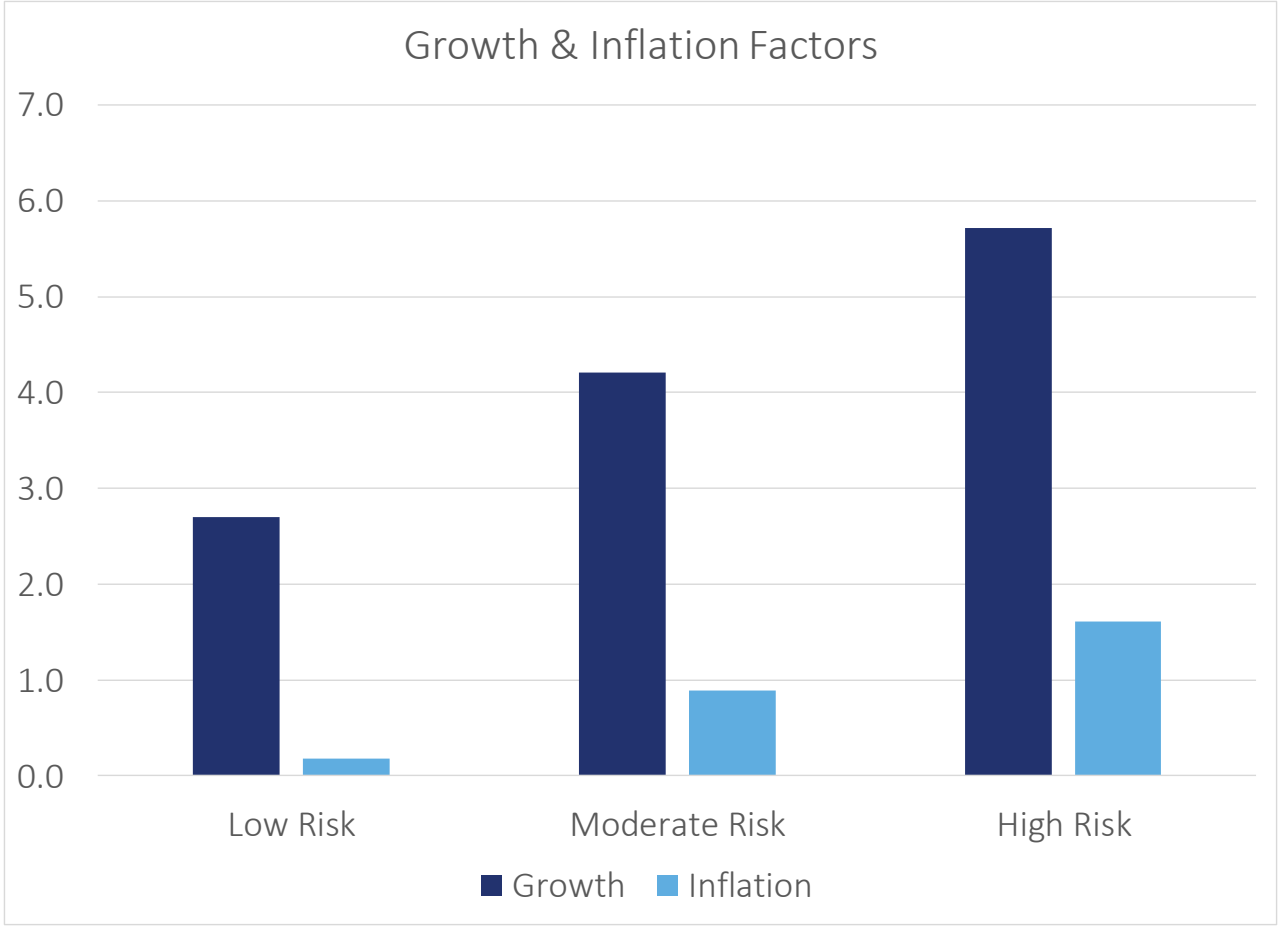



Data Source: Wilshire Compass

# Portfolio Factor Exposures

- Portfolio exposures can help identify risk concentrations that may not have been readily apparent previously

- Moderate Risk Portfolio, which showed reasonable balance across investment buckets, reveals notable exposure to growth
  - Suggests portfolio may be particularly vulnerable to periods of slowing or contracting growth
  - Due to heavy growth exposures of equities and high yield bonds, whose similar behavior during a downturn would be masked by a static correlation estimate



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# Why do we care about absolute return strategies?

IPERS

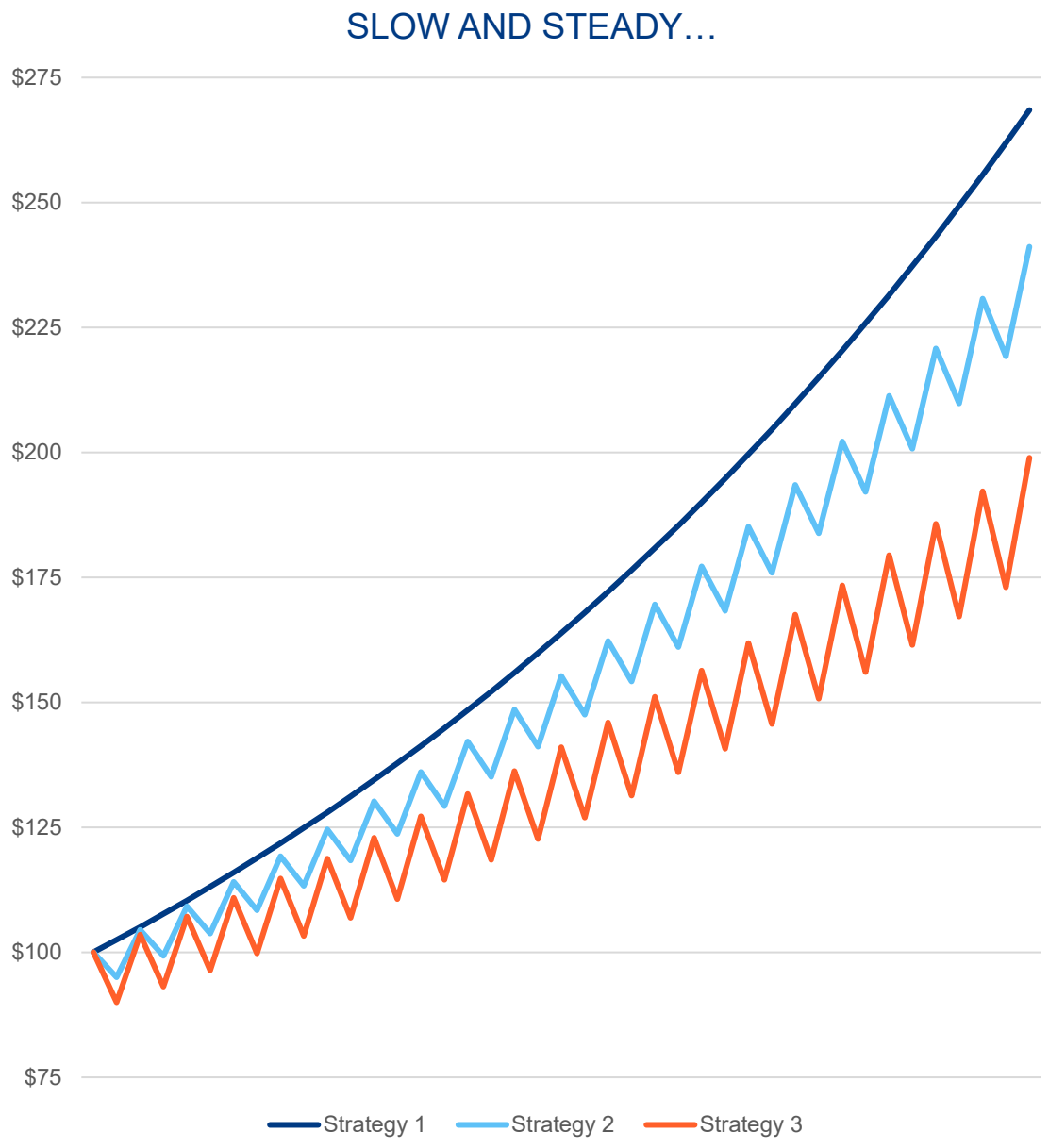
**John Fujiwara, Head of Strategy**

**Sheldon Lien, Senior Retirement Officer**

September 26, 2024

# Lower downside volatility enhances compounding

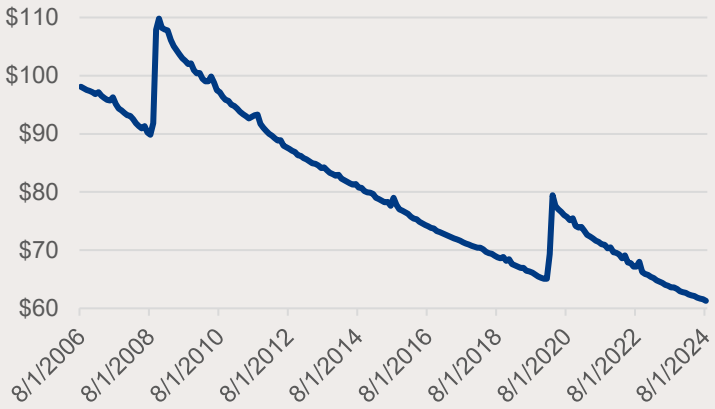
| Performance | | |
|---|---|---|
| Strat 1<br>Constant | Strat 2<br>↓5% ↑10% | Strat 3<br>↓10% ↑15% |
| .025 | -0.05 | -0.1 |
| .025 | 0.1 | .15 |
| .025 | -0.05 | -0.1 |
| .025 | 0.1 | .15 |
| .025 | -0.05 | -0.1 |
| .025 | 0.1 | .15 |
| .025 | -0.05 | -0.1 |
| .025 | 0.1 | .15 |



# 2 Options for reducing downside volatility

| Feature | Deterministic Hedging | Statistical Hedging |
|---|---|---|
| **Commonly Known As:** | **Buying Insurance/Puts** | **Adding Diversification** |
| Approach | Predetermined based on known relationship | Statistical models based in historical data |
| Predictability | Highly predictable | Not as predictable |
| Flexibility | Limited | Higher |
| Complexity | Simple | More complex |

SYSTEMATIC PUT BUYING LOOKS LIKE THIS...




A DIVERSIFYING STRATEGY CAN LOOK LIKE THIS....

# Let's try something…a real-life analysis

**Compare Returns of:**

**Equity Portfolio**

100% S&P 500

---

**Equity Portfolio + Deterministic Hedge**

90% S&P 500 + 10% Put Buying Strat

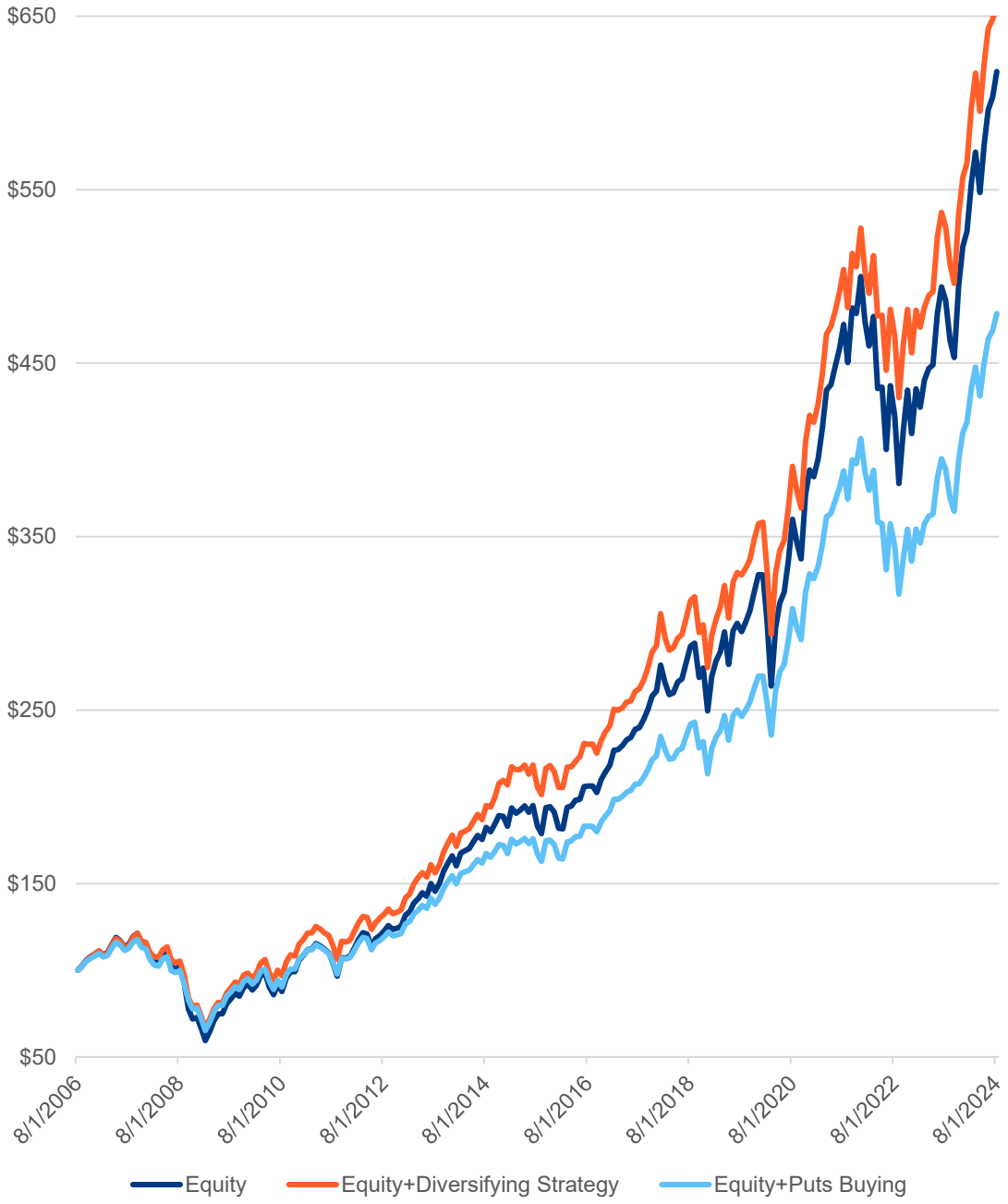
---

**Equity Portfolio + Statistical Hedge**

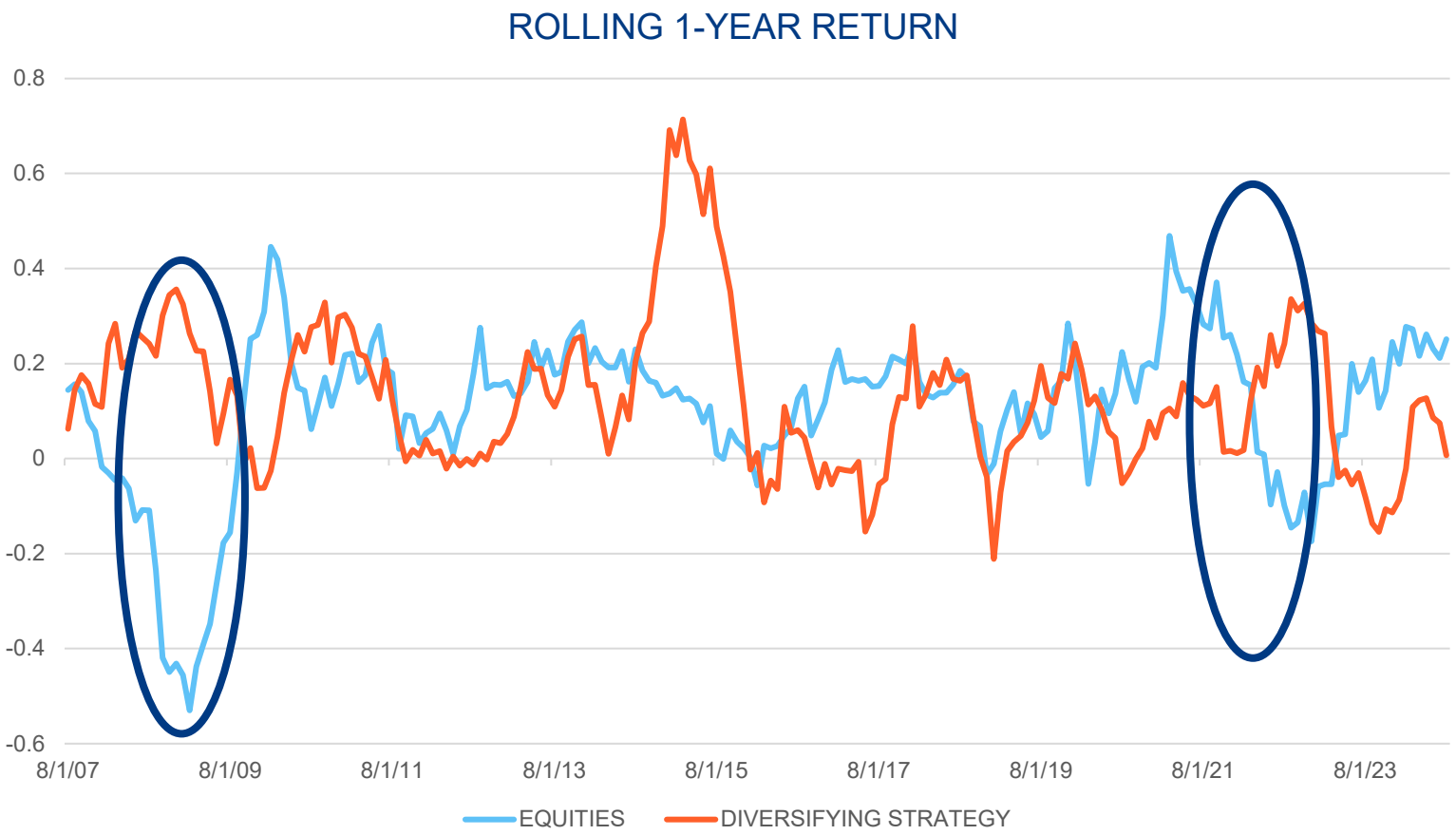
90% S&P 500 + 10% Diversifying Strat

| Portfolio | Equity | Equity + Put Buying | Equity + Diversifying Strat |
|---|---|---|---|
| Return | 11.39% | 9.61% | **11.50%** |
| Volatility | 15.60% | 13.28% | **14.09%** |
| Sharpe | 0.7299 | 0.7236 | **0.8162** |
| Final Value | $618.02 | $478.54 | **$657.02** |

# Visual comparison



# Can we really see the value of diversification?



# Dollars at risk