EQUITY FACTOR STRATEGY POLICY DISCUSSION

Presented by:
Pension Consulting Alliance

John J. Burns, CFA
Allan Emkin

June 24,,2015

PCA | PENSION CONSULTING ALLIANCE

Equity Factor Portfolio

Executive Summary

- Academic research and long-term investor experience support the investment merits of equity factor investing

- A well-crafted equity factor portfolio, executed in size, has the potential to improve the portfolio's efficiency (return per unit of risk), consistent with ERSRI investment philosophy

- The proposed allocation to an equity factor portfolio is designed to capture multiple long-term equity factor risk premia

- The following discussion addresses the policy issues that need to be considered to institute an equity factor portfolio strategy

PCA PENSION CONSULTING ALLIANCE

Equity Factor Portfolio

What is Equity factor investing?

- Investment strategy designed to systematically capture equity factor risk premia that have historically provided investors with returns above the market return

- Excess return premia exist
  - Due to investor behavioral biases
  - As compensation for taking a specific risk

- Some examples of factor premia include:
  - Momentum: stocks that have outperformed (underperformed) in the recent past will continue to outperform (underperform)
  - Quality: stocks with higher profitability, earnings consistency and lower leverage outperform
  - Size: smaller capitalization stocks outperform larger capitalization stocks
  - Volatility: stocks with lower volatility outperform more volatile stocks
  - Valuation : stocks with cheaper fundamental valuation outperform higher valuation stocks

- An Equity factor strategy may invest in a subset or combination of these factors

PCA PENSION CONSULTING ALLIANCE

Equity Factor Portfolio

Proposed ERSRI approach

- Long-only equity factor portfolio
  - No shorting
- Equally-weighted Quality / Value / Momentum factors portfolio (details pages 5-6)
- Developed Equity markets only (No Emerging Markets)
- 2% - 2.5% per year expected tracking error target
- TBD % of global developed equity market portfolio
- Separate account, custodied at BONY / Mellon

PCA PENSION CONSULTING ALLIANCE

Equity Factor Portfolio

Proposed ERSRI Approach

- Equally-weighted Quality / Value / Momentum factors portfolio
- Quality Factor Portfolio Attributes:
  - Return on Equity
  - L-T Debt / Common Equity
  - Earnings Variability
- Value Factor Portfolio Attributes:
  - Earnings / Price
  - Cash Earnings / Price
  - Sales / Price
  - Dividends / Price
  - Book / Price
- Momentum Factor Portfolio Attributes:
  - Trailing 12 month return
- 2% - 2.5% expected tracking error for the combined equity factor portfolio

PCA PENSION CONSULTING ALLIANCE

Equity Factor Portfolio

Proposed ERSRI Approach

- The model and rules-based portfolio construction process is designed to efficiently capture an investment factor exposure (or multiple factors) in aggregate
  - All factor exposures are expressed by being over or under weight to a market capitalization-weighted index
    - No shorting of stocks with undesirable characteristics
  - The model and investment process work or they do not over a measured period
  - There are few other variables or moving parts that will contribute to the success or failure of the strategy
- The investment manager's primary role is to run the model and execute the model output (rebalance the portfolio)
  - Execution is systematic; manager does not exercise active discretion
- The portfolio is fully invested in equity securities (low cash holdings)

PCA PENSION CONSULTING ALLIANCE

Equity Factor Portfolio

What are the ERSRI equity factor portfolio's investment objectives relative to the market capitalization-weighted index?

- Higher Sharpe Ratio (more efficient portfolio) through a combination of
  - Higher return, and / or
  - Lower return volatility than the benchmark
- Lower beta than the market capitalization-weighted index
  - Proposed approach has 0.93 beta
- Smaller drawdown in a bear market
  - Expectation that returns will be less negative than the benchmark in an equity market crisis
- Diversification
  - Less correlated with the market capitalization-weighted indices

Equity Factor Portfolio

Why do investors believe equity factor exposure should be rewarded?

- Some of the expectation for a positive outcome is driven by a belief that the market capitalization-weighted index is an imperfect investment
  - An index fund is often heavily weighted in the largest 10 -20 stocks – and therefore, not well diversified
  - (I.e. Russell 3000 top 10 stocks represent 14% of the index weight, the top 20 stocks 21%)

- Market capitalization-weighted index funds require the investor to invest a larger allocation in stocks that have recently gone up in price and a lower allocation in stocks that have recently gone down in price.
  - This issue is most acute in the very largest portfolio holdings, which may be overpriced.

PCA PENSION CONSULTING ALLIANCE

Equity Factor Portfolio

What are the benefits of equity factor investments?

- Low cost strategy relative to active management strategies (4 bps vs 40-50 bps)
- Scalable strategy – large manager investment capacity
- Liquid strategy – daily liquidity; more liquid than existing index fund portfolios with semi-monthly liquidity
- Focus on improving Sharpe ratio is consistent with ERSRI investment philosophy
- Diversifies the long-only global equity portfolio that is currently 100% invested in market capitalization-weighted indices
  - Equity market risk is the total portfolio's largest risk (the total portfolio has a 0.52 beta)

PCA PENSION CONSULTING ALLIANCE

Equity Factor Portfolio

What are the benefits of the proposed factor portfolio construction approach?

- Individual equity factor returns tend to be cyclical and can be in and out of favor at different points in the investment cycle
- Since the three factors (quality, value and momentum) are not highly correlated, combing them in one portfolio should reduce the tracking error of the total equity factor portfolio
- Reduces the chances of protracted periods of underperformance relative to the market capitalization-weighted benchmark by combining multiple, diversifying factors and by targeting low (2% - 2.5%) tracking error
- Holding stocks in a separately managed account allows for greater transparency and liquidity

PCA PENSION CONSULTING ALLIANCE

Equity Factor Portfolio

What are the risks of equity factor investing?

- The strategy could underperform the market capitalization-weighted index in certain market environments; individual factor returns are cyclical
  - The equity factors may be out of favor for extended periods (2-3 years)
  - Even if the factors start to outperform, it could take additional time to recover all the prior relative underperformance
- The strategy could exceed expected tracking error targets (on upside or downside) (see page 13)
- Strategy is based on back-tested data (see page 14)
- Success requires investor conviction – need to stick with the strategy when it underperforms
  - Abandoning the strategy mid-stream will lock in losses with no prospect to recover them

Equity Factor Portfolio

What are the risks of equity factor investing?

- Portfolio turnover and transaction costs will increase
  - 50% one-way annual turnover vs. Russell 3000 and EAFE index 3% each
  - 30 bp transaction costs vs. Russell 3000 index 1 bp and EAFE Index 2 bp
- Fees will be higher (4 bps vs. 2 bps for the index portfolios)
- Proxies will need to be voted, requiring hiring of a proxy advisor

PCA PENSION CONSULTING ALLIANCE

Equity Factor Portfolio

What are the risk constraints on this strategy?

- Risk constraints are usually expressed and managed as tracking error
  - The standard deviation of the difference in the portfolio and benchmark returns over time
  - A measure of the volatility of the manager value added
- Tracking error is used to express the expected range of active return outcomes in one year (positive or negative vs. the benchmark)
  - 68% confidence = tracking error (i.e. ± 2%)
  - 95% confidence = 2x tracking error (± 4%)

Tracking error in perspective

- What does a 2% - 2.5% expected tracking error compare to?
  - Traditional active manager portfolio (i.e. U.S. large cap growth): 300-500 bps
  - Portfolio of multiple of active managers (active manager composite): 150 – 225 bps
  - ERSRI long-only global equity portfolio's expected tracking error is low
    - Tracking error's range from +10 bp for the Russell 3000 index and EAFE Index portfolios to +40 bp for the MSCI Emerging Markets Index portfolio

PCA PENSION CONSULTING ALLIANCE

Equity Factor Portfolio

Risk of equity factor investing

- Although academic research and long-term investor experience seem to support the investment merits of equity factor investing, actual live experience systematically and explicitly capturing equity factors is relatively short
  - PCA has several clients deploying equity factor strategies
    - CalPERS - $10 billion
    - Oregon Investment Council - $2 billion
    - San Joaquin County ERA - $250 million
    - TriMet - $62 million
- Most of the evidence and support for this approach is garnered from back-tested (simulated) modeling – which has limitations
  - There is a risk that future experience will be different than the back-tested experience
- It would be prudent to assume that actual experience could be less robust than the back-tested data over shorter measurement timeframes

PCA PENSION CONSULTING ALLIANCE

Equity Factor Portfolio

SIC Required Actions:

- Investment Policy Decisions
  - Allocation amount to equity factor portfolio strategy
  - Approve Equity factors to capture
  - Approve Portfolio tracking error target
  - Approve Rebalancing policy between Market Cap-weighted index funds and equity factor portfolio

- Create Investment Policy Document

PCA PENSION CONSULTING ALLIANCE

DISCLOSURES: This document is provided for informational purposes only. It does not constitute an offer of securities of any of the issuers that may be described herein. Information contained herein may have been provided by third parties, including investment firms providing information on returns and assets under management, and may not have been independently verified. The past performance information contained in this report is not necessarily indicative of future results and there is no assurance that the investment in question will achieve comparable results or that the Firm will be able to implement its investment strategy or achieve its investment objectives. The actual realized value of currently unrealized investments (if any) will depend on a variety of factors, including future operating results, the value of the assets and market conditions at the time of disposition, any related transaction costs and the timing and manner of sale, all of which may differ from the assumptions and circumstances on which any current unrealized valuations are based.

Neither PCA nor PCA's officers, employees or agents, make any representation or warranty, express or implied, in relation to the accuracy or completeness of the information contained in this document or any oral information provided in connection herewith, or any data subsequently generated herefrom, and accept no responsibility, obligation or liability (whether direct or indirect, in contract, tort or otherwise) in relation to any of such information. PCA and PCA's officers, employees and agents expressly disclaim any and all liability that may be based on this document and any errors therein or omissions therefrom. Neither PCA nor any of PCA's officers, employees or agents, make any representation of warranty, express or implied, that any transaction has been or may be effected on the terms or in the manner stated in this document, or as to the achievement or reasonableness of future projections, management targets, estimates, prospects or returns, if any. Any views or terms contained herein are preliminary only, and are based on financial, economic, market and other conditions prevailing as of the date of this document and are therefore subject to change.

The information contained in this report may include forward-looking statements. Forward-looking statements include a number of risks, uncertainties and other factors beyond the control of the Firm, which may result in material differences in actual results, performance or other expectations. The opinions, estimates and analyses reflect PCA's current judgment, which may change in the future.

Any tables, graphs or charts relating to past performance included in this report are intended only to illustrate investment performance for the historical periods shown. Such tables, graphs and charts are not intended to predict future performance and should not be used as the basis for an investment decision.

All trademarks or product names mentioned herein are the property of their respective owners. Indices are unmanaged and one cannot invest directly in an index. The index data provided is on an "as is" basis. In no event shall the index providers or its affiliates have any liability of any kind in connection with the index data or the portfolio described herein. Copying or redistributing the index data is strictly prohibited.

The Russell indices are either registered trademarks or trade names of Frank Russell Company in the U.S. and/or other countries.

The MSCI indices are trademarks and service marks of MSCI or its subsidiaries.

Standard and Poor's (S&P) is a division of The McGraw-Hill Companies, Inc. S&P indices, including the S&P 500, are a registered trademark of The McGraw-Hill Companies, Inc.

CBOE, not S&P, calculates and disseminates the BXM Index. The CBOE has a business relationship with Standard & Poor's on the BXM. CBOE and Chicago Board Options Exchange are registered trademarks of the CBOE, and SPX, and CBOE S&P 500 BuyWrite Index BXM are servicemarks of the CBOE. The methodology of the CBOE S&P 500 BuyWrite Index is owned by CBOE and may be covered by one or more patents or pending patent applications.

The Barclays Capital indices (formerly known as the Lehman indices) are trademarks of Barclays Capital, Inc.

The Citigroup indices are trademarks of Citicorp or its affiliates.

The Merrill Lynch indices are trademarks of Merrill Lynch & Co. or its affiliates.

FTSE is a trademark of the London Stock Exchange Group companies and is used by FTSE under license. All rights in the FTSE indices and/or FTSE ratings vest in FTSE and/or its licensors. No further distribution of FTSE data is permitted with FTSE's express written consent.