

C. 1. ERS Investment Plan Summary

| | |
|--|---|
| Type of Plan | Defined Benefit |
| December 31, 2016 | \$14.9 Billion |
| Investment Planning Time Horizon | 5 years |
| Expected Annualized Return and Risk | Based on the 2015 Asset-Liability Study, the target allocation is expected to achieve an average annualized return of 7.8% (4.8% real return with expected inflation of 3.0%). The annual compound return over a ten-year period is expected to fall within a range of 4.9% and 10.7% approximately two-thirds of the time. |

Primary Goal

The preservation of capital is of primary concern of the Employees' Retirement System of the State of Hawaii ("ERS" or "Plan"). The Board of Trustees of the ERS ("Board of Trustees" or "Board") seeks preservation of capital with a consistent, positive return for the Plan. Although pure speculation is to be avoided, the Board appreciates the fact that an above average return is associated with a certain degree of risk. Risk to be assumed must be considered appropriate for the return anticipated and consistent with the total diversification of the Plan.

Structure

During 2014, the ERS adopted a risk-based, functional framework for allocating capital within the total portfolio. This framework makes use of strategic/functional classes that in-turn utilize underlying asset classes and strategies. Each of these classes is designed to achieve a certain goal (e.g., Real Return class) and/or be exposed to a specific set of macroeconomic risks that are common amongst the different strategy types and/or assets within the class (e.g., Broad Growth class). As a result of this structure, each strategic class is expected to be exposed to a set of major and minor macroeconomic risks. Each program's policy section contains a list of the relevant macroeconomic risks. Definitions for each of these macroeconomic risks can be found in Appendix B of this Manual.

Evolving Strategic Allocation Targets

As a result of the 2015 Asset-Liability Study conducted by the ERS Board, Investment Staff, and general investment consultant, the ERS approved a new long-term strategic allocation policy. This new long-term strategic allocation policy will be implemented in phases as highlighted in the table below.

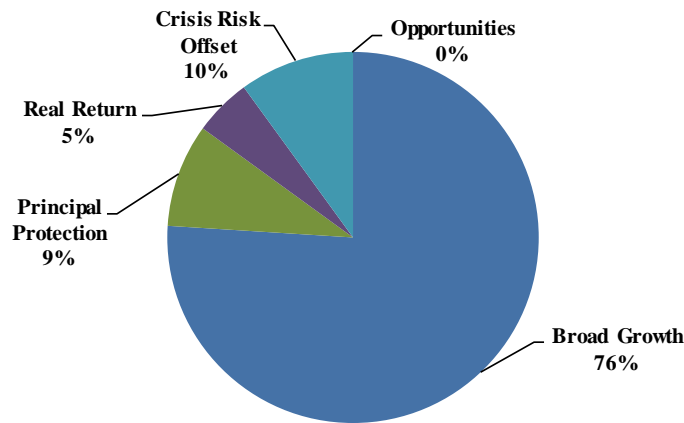
| Implementation Plan for Long-term Policy | | | | | |
|--|-----------------------|-------------|-------------|-------------|-----------------------|
| | Current (4/1/2017) | 1/1/2018 | 1/1/2019 | 1/1/2020 | Long-Term 7/1/2020 |
| Broad Growth | 76% | 72% | 68% | 64% | 63% |
| Principal Protection | 9% | 8% | 8% | 7% | 7% |
| Real Return | 5% | 7% | 8% | 9% | 10% |
| Crisis Risk Offset | 10% | 13% | 16% | 20% | 20% |
| Opportunities | 0% | 0% | 0% | 0% | 0% |
| <i>Total Portfolio</i> | <i>100%</i> | <i>100%</i> | <i>100%</i> | <i>100%</i> | <i>100%</i> |

Interim Strategic Allocation Target (4/1/2017 – 12/31/2017)

The ERS will be invested according to the following strategic class targets and ranges:

| | <u>Lower Limit</u> | <u>Interim Strategic Allocation</u> | <u>Upper Limit</u> |
|----------------------|--------------------|-------------------------------------|--------------------|
| Broad Growth | 66% | 76% | 86% |
| Principal Protection | 6% | 9% | 12% |
| Real Return | 0% | 5% | 10% |
| Crisis Risk Offset | 8% | 10% | 12% |
| Opportunities | 0% | 0% | 3% |

The Chief Investment Officer of the ERS (“CIO”) may set the actual class levels anywhere within the upper and lower limits above. For deviations in excess of +/- 3%, the CIO shall provide regular ongoing justifications for the deviations. Adjustments in the above targets may be reviewed in conjunction with the annual strategic allocation review. The general investment consultant should conduct a formal strategic allocation study at least every three years for the Board of Trustees to verify or amend the strategic targets and ranges.



Total Investment Portfolio Evaluation Benchmark

To monitor the total investment portfolio result, a custom benchmark is constructed to measure the target mix. This target benchmark mix will evolve over time, but it is based on the above-highlighted evolving allocation targets and the broad benchmarks listed below (i.e. evolving weights x benchmark return).

- Broad Growth Blended Benchmark*
- Principal Protection Benchmark: Barclays Global Intermediate Aggregate ex. Credit (hedged)
- Real Return Benchmark: CPI + 3%
- Crisis Risk Offset Blended Benchmark*

Individual ERS investment managers (“Investment Managers” or “investment managers”) will not be measured against this total investment portfolio objective. However, it is expected that the sum of their efforts will exceed the objective over time.

*Refer to program section for detailed description of benchmark, and possible evolving benchmark timeline

C. 9. Strategic Allocation Rebalancing Guidelines

A. Rebalancing Assets within the Strategic Allocation

One essential component of a strategic allocation policy is the development and use of rebalancing ranges for the target allocation. According to several studies, systematic rebalancing should reduce portfolio volatility and increase a portfolio's risk-adjusted return. Using the ERS's long-term strategic target allocation, the greatest enhancement to investment performance (i.e., enhancing the annualized return while lowering the risk) is achieved by the rebalancing range shown below.

B. Target Mix with Rebalancing Ranges

| | <u>Lower Limit</u> | <u>Interim Strategic Allocation</u> | <u>Upper Limit</u> |
|----------------------|--------------------|---|--------------------|
| Broad Growth | 66% | 76% | 86% |
| Principal Protection | 6% | 9% | 12% |
| Real Return | 0% | 5% | 10% |
| Crisis Risk Offset | 8% | 10% | 12% |
| Opportunities | 0% | 0% | 3% |

The Investment Staff will maintain the classes within their target ranges primarily by using cash flows, although the actual allocations will be rebalanced whenever a class is outside of its strategic target range. The Board of Trustees should review the targets and ranges annually for reasonableness relative to significant economic and market changes, and relative to changes in the ERS's long-term goals and objectives.

If the Plan has positive cash flow (i.e., contributions exceeding disbursements), Investment Staff has the discretion to rebalance by directing new moneys to the under allocated strategic classes on a pro-rata basis. If the Plan has negative cash flow, Investment Staff has the discretion to withdraw moneys to be disbursed from over allocated strategic classes. In each case, the CIO shall keep the Board of Trustees apprised of current asset movements. Managing strategic allocations in this manner should not incur any additional transaction cost beyond what would have been normally incurred to liquidate or invest assets.

Because of the unique valuation characteristics of Real Return and Real Estate, these strategic classes have more subjective rebalancing ranges relative to their target allocation. Concerns of liquidity and the long-term horizon for these investments suggest a more infrequent rebalancing schedule. Accordingly, other more qualitative considerations (e.g., transaction costs, liquidity needs, investment time horizons, etc.) regarding the timing of rebalancing Real Return and Real Estate will be important to consider with the guidelines shown above.



CRISIS RISK OFFSET PROGRAM

SECTION I

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I.1. Overview

A. General Description

The Crisis Risk Offset (“CRO”) class is structured to invest in strategies and assets that are largely exposed to systematic market-based and non-market-based risk premiums that are expected to behave in a manner that is primarily distinct or counter to the equity risk premium. Such investments are typically designed to exhibit volatility that is in-line with the risk of the Broad Growth class. Having this level of volatility is important so that during periods of Broad Growth stress, the CRO class can feasibly move by a similar extent in the opposite direction. The CRO class consists of three major components: Treasury Duration Capture (“TDC”), Systematic Trend Following (“STF”), and Alternative Return Capture (“ARC”).

The TDC component consists of highly-liquid long-maturity cash bonds or equivalent (derivatives-based) investments. This component has proven to be the most responsive to equity-related market crises as global investors seek the highest-quality asset possible during such periods. The TDC component could be viewed as the “first-responder” during an equity-related crisis as it tends to appreciate significantly in a crisis’ initial phases.

The STF component consists of investment strategies that systematically seek to capture trending market behavior (either positive or negative) across dozens, if not hundreds, of different markets. Trends take time to form, but once they do, there is significant evidence that shows positive returns can be generated by investing in persistent trends. In this respect, STF strategies provide subsequent support/substitution to the TDC component during the mid-to-latter stages of a market crisis. STF strategies also trade in highly-liquid, transparent markets and the capital invested in such strategies is easily accessible.

The ARC component consists of investment strategies that systematically seek to capture the long-term returns of certain well-known risk premiums (e.g., value, carry, momentum, low-volatility, etc.) without being exposed to the broader markets where these risk premia reside. Over time these various risk premia are expected to produce positive returns (just like the well-known equity risk premium) that are generally unrelated to the other major market risk premia (e.g., equity, interest rates, inflation, etc.). Markets and instruments utilized by ARC strategies are also highly-liquid, but their capture requires significant leverage.

Due to the need to capture certain risk premia and avoid other risk premia, both the STF strategies and the ARC strategies rely heavily on the use of derivatives. In addition, derivatives-based leverage is often utilized to calibrate the expected risk of these strategies to the risk of the investments that these components are intended to protect against.

B. Purpose

The total portfolio is expected to produce a positive long-term real (inflation-adjusted) compound return. In order to achieve such a return, the total portfolio must accept exposures to various major broad-based market risks, in particular risk that is associated with exposure to economic growth. A major challenge is that economic growth and those assets with the most exposure to capitalizing on economic growth (e.g., public equity) are sensitive to uncertainty regarding levels and duration of economic growth, introducing significant volatility into the return behavior of a diversified investment portfolio. And, as is well-known, periods of significant depreciation (worse than -20%) in such growth-related investments can occur, putting pressure on those parties that rely on the outcomes of the total portfolio. By design, the CRO class seeks to produce significant increases in value coincident with significant declines in the values of growth-risk exposed assets. This return-offset feature is the CRO class's primary purpose. Assuming the class fulfills this objective, the return pattern of the overall portfolio will become more stable over time and exhibit lower exposure to the dangers of bearing significant growth risk.

Given its crisis-period focus and its designed relatively high volatility, the CRO may produce challenging performance of its own, particularly during non-crisis periods. The non-TDC components (particularly ARC) are included to supplement the TDC component during these periods while not necessarily relying upon economic growth to achieve positive results. The expectation is that the CRO would produce a modest positive real compound return during these more growth-accommodating periods.

C. Risk Factor ExposuresMajor

- *Interest Rate Risk (due to Long Treasury Duration component)*
- *Inflation Risk*
- *Varying market-based risks based upon their trending behaviors*

Minor

- *Specific non-market systematic style risks (periodic)*

I.2. Class Structure

A. Legal Structure

The CRO class utilizes a series of Delaware LLC's, one for each CRO investment manager, to ensure transparency of the assets and transactions in each account, ensure the ability to subscribe or redeem units daily, and limit liability.

B. Components

The CRO class consists of three major components: TDC, STF, and ARC.

Treasury Duration Capture

- Portfolios of long-dated (maturities in excess of 10 years) high-quality bonds (Treasuries and Government-backed high-quality, very liquid agencies) that can be sold in their entirety at market price within 24 to 48 hours.
- Portfolios of cash-collateralized derivatives that mirror the performance of long-dated high-quality bonds and maintain the TDC duration/volatility targets.

Systematic Trend Following

- Long-short portfolios utilizing both cash and derivatives-based instruments to capture both periodic appreciation and periodic depreciation trends that evolve and dissipate across a very wide array of liquid global markets. Risk/volatility is calibrated to a pre-determined level utilizing cash and derivatives-based leverage.

Alternative Return Capture

- Long-short portfolios utilizing both cash and derivatives-based instruments to capture well-researched/documented non-market risk premiums (e.g., momentum, carry, value, low-volatility, etc.) on a continuous basis, utilizing an array of liquid global markets. Risk/volatility is calibrated to a pre-determined level utilizing cash and derivatives-based leverage.

C. Modifications to Class/Component Structure

Modifications to the CRO class's structure can take five potential forms:

- i. Changing the legal structure;
- ii. Adding or deleting a specific component;
- iii. Revising allocation levels and ranges among the components;
- iv. Adjusting the breadth of investment strategies utilized within each component;
- v. Possible use of internal management for the TDC portfolio.

Modifications to the CRO's structure will occur only with approval of the Board of Trustees.

D. Components' Allocations and Allocation Ranges

The CRO class's allocation targets and allocation ranges among its three major components are as follows (as a percent of total CRO class assets):

Long-term CRO Class Component Allocation Policy*

| <u>Component</u> | <u>Lower Limit</u> | <u>Upper Limit</u> |
|----------------------------|--------------------|--------------------|
| Treasury Duration Capture | 20% | 30% |
| Systematic Trend Following | 40% | 50% |
| Alternative Return Capture | 25% | 35% |

*Capital allocations are a function of the underlying risks of each component (see Sections I.3.B. and I.3.C. below). In December 2015, the Board approved a pro forma capital allocation structure of 25% Treasury Duration Capture, 45% Systematic Trend Following, and 30% Alternative Return Capture. This allocation structure translates to an expected annualized volatility of $\approx 12\%$, which is close to the expected volatility of the ERS's public growth portfolio. Allocations within the above ranges should generally adhere to the Board-approved structure.

E. Management of Components

To manage the assets assigned to the CRO class components, the Board of Trustees ("Board of Trustees" or "Board") of the Employees' Retirement System of the State of Hawaii ("ERS") utilizes external investment managers ("investment managers"), a CRO Platform Manager, ERS investment staff, and the ERS General Consultant.

Each investment manager is responsible for executing the particular investment strategy (i.e., mandate) that the ERS has hired them to manage. Investment managers perform all of the typical investment functions expected for separately managed accounts with the addition of daily oversight by the CRO Platform Manager.

The CRO Platform Manager, acting as a fiduciary to the ERS, is responsible for establishing the managed account structure and service provider relationships; serving as manager of the LLC's; overseeing the day-to-day operations of the CRO class, components, managed accounts and managers, including measuring market risk, enforcing compliance to CRO policies, procedures, limits and guidelines as well as systematically rebalancing the accounts utilizing the rebalancing rules established in the CRO Procedures Manual; helping to identify crisis situations; conducting annual manager operational due diligence; and communicating with and advising the ERS investment staff on investment/risk guidelines.

The ERS investment staff, and in particular the ERS CRO Manager designated by the ERS CIO, is responsible for evaluating and recommending investment managers and CRO Platform Manager candidates to the ERS Board, conducting onsite investment manager (at least biannually) and CRO Platform Manager (annually) due diligence, monitoring the CRO class on a daily basis, allocating capital to and adjusting risk targets for CRO components and investment managers, creating and maintaining the CRO Procedures Manual, adjusting investment and risk guidelines/limits, establishing the CRO rebalancing rules, and reporting class level risk/return metrics to the ERS Board on a monthly basis. The ERS CIO is responsible for monitoring the CRO class on a weekly basis and determining the response to crisis situations.

The General Consultant is responsible for monitoring the CRO class on a monthly basis, advising the ERS CRO Manager and CIO on CRO policy, procedures, limits and guidelines, assisting the ERS investment staff in its due diligence and oversight responsibilities, and providing quarterly/annual evaluations of the CRO class to the ERS Board.

The ERS Board is responsible for approving this CRO Policy; approving the CRO structure; approving the CRO investment managers; delegating responsibilities to the ERS investment staff, CRO Platform Manager, General Consultant, and CRO investment managers; and periodically reviewing the performance and risk profile of the CRO class, components, and managers.

Within each component, assets are expected to be allocated across one or more mandate(s). In combination, these mandates capture a broad, representative sampling of the available investment opportunity set within the specified component. The mandate allocations within each component are as follows:

Treasury Duration Capture Component Allocation Policy

| | |
|---------------------|-----------|
| Passive/Replication | 0% - 100% |
| Active | 0% - 100% |

Systematic Trend Following Component Allocation Policy

| | |
|---------------------|-----------|
| Passive/Replication | 0% - 50% |
| Active | 0% - 100% |

Alternative Return Capture Component Allocation Policy

| | |
|---------------------|------|
| Passive/Replication | 0% |
| Active | 100% |

F. CRO Component's Managers and Managers' Allocations

To manage the assets allocated to each strategic class and its underlying components, the Board delegates investment authority to external investment managers. The ERS's General Consultant and investment staff have joint authority for identifying and selecting investment manager candidates for specific investment mandates. The Board has final authority over the selection of specific managers for each mandate. ERS investment staff has the authority to determine the initial funding level for each investment manager approved by the ERS Board and manage the allocation to each investment manager on an ongoing basis. Under this authority, ERS investment staff may reduce funding to one or more specific manager(s) and/or increase funding to one or more specific manager(s) as long as the risk profile of each component is maintained. The investment manager allocations within each component are as follows:

Treasury Duration Capture Component Manager Allocation Policy

| | |
|------------------|---|
| | |
| Active Managers: | 0% - 100% per manager. Up to two managers approved by the Board may be funded. |

Systematic Trend Following Component Manager Allocation Policy

| | |
|-------------------------------|---|
| | |
| Active Managers: | 0% - 50% per manager. |
| Passive/Replication Managers: | 0% - 50% per manager. Up to four managers approved by the Board may be funded. |

Alternative Return Capture Component Manager Allocation Policy

| | |
|------------------|---|
| | |
| Active Managers: | 0% - 50% per manager. Up to four managers approved by the Board may be funded. |

I.3. Return Objectives & Risk Profile

A. Class Return Benchmarks

Within the CRO class, the standards for component performance reporting may vary. Keeping this in mind, the ERS utilizes the target benchmark below to monitor the performance results of the aggregate CRO class:

$$\begin{aligned}
 &25\% \text{ Barclays Capital U.S. Treasury Long Index} + \\
 &45\% \text{ MLM Global Index (15\% Vol)}^* + \\
 &30\% \text{ (90 Day Treasury Bills} + 5\%/year)
 \end{aligned}$$

*The MLM Global Index (15% Vol) is the Mount Lucas Management Enhanced Volatility (MLM-EV) Index with the addition of an allocation to equity index derivatives. Through the use of derivative-based leverage, the MLM Global Index (15% Volatility) is leveraged approximately 3X the equivalent fully-collateralized index in order to calibrate its expected volatility to a level that is similar to the volatility exhibited by the MSCI ACWI benchmark.

The CRO class portfolio is expected to match or outperform the above benchmark, net of fees, over a full market cycle. An appropriate measure of a market cycle would be rolling 5-year periods. The CRO class portfolio should outperform its benchmark, net of fees, over the majority of rolling 5-year periods. The ERS CRO Manager, in consultation with the CRO Platform Manager and General Consultant, will establish an appropriate volatility benchmark composed of investable indices to compare to the CRO realized volatility.

The Treasury Duration Capture component portfolio is expected to outperform the following target benchmark, net of fees, over the majority of rolling 5-year periods:

$$\text{Barclays Capital U.S. Treasury Long Index}$$

The Systematic Trend Following component portfolio is expected to outperform the following target benchmark, net of fees, over the majority of rolling 5-year periods:

MLM Global Index (15% Vol)

The Alternative Return Capture component portfolio is expected to outperform the following target benchmark, net of fees, over the majority of rolling 5-year periods:

90-Day Treasury Bills + 5%/year

B. Class Risk and Return Profile

In aggregate, the CRO is designed to be an offsetting class that hedges against large declines in growth-exposed assets (e.g., public equity and credit) during severe bear market/crisis periods. Based on current capital market assumptions and the CRO class's long-term structure, there is a low probability that this class could lose a portion of its capital over a 10-year period. While not producing the bulk of the ERS Plan's expected investment returns, the CRO class is positioned to provide positive nominal returns and opportunities to reallocate capital to undervalued assets over the long-term. This class is meant to meaningfully complement the high volatility associated with the ERS public growth portfolio, while providing a level of return moderately above the ERS Principal Protection class. A strategic allocation to the CRO class should provide an improved level of diversification for the total portfolio. The class may be negatively impacted by periods of rapid economic growth, significant inflation, rapid shifts in correlations among asset class and/or periods of volatile markets without sustained trends.

The aggregate CRO class has a total risk (standard deviation) range/budget in order to effectively counterbalance the volatility experienced in the ERS's major growth-oriented components. There is also a value-at-risk limit (one day CRO NAV loss at a 5% probability) established by the ERS CRO Manager in consultation with the CRO Platform Manager and General Consultant to ensure that downside CRO risk is contained. These limits are provided below.

CRO Class Absolute Risk Level Maintenance Policy

| <u>Measure</u> | <u>Lower Risk Limit</u> | <u>Upper Risk Limit</u> |
|-----------------------|-------------------------|-------------------------|
| Annualized Volatility | 8% | 18% |
| Value at Risk (5%) | n/a | <=2.0% |

If the behavior of the CRO class causes its recent historical volatility to deviate significantly beyond these limits, then a rebalancing process and/or target volatility adjustment should occur among the CRO managers based on recent risk profiles of each manager/component as well as on prospective risk views for each manager/component.

C. Component Risk Profiles

The ERS is expected to manage the Treasury Duration Capture component portfolio by taking active risk (tracking error) around its benchmark discussed under Section I.3.A. above. Active risk within a specific component portfolio is the aggregation of several risks taken/accepted by ERS investment staff and/or the CRO investment manager(s) as they implement the component portfolios. Types of active risk include: security selection risk, sector/style bias risk, manager weighting risk, and benchmark misfit risk. The expected volatility and allowable active risk ranges for the Treasury Duration Capture component are shown in the table below. These risk budgets may be further restricted by the ERS CRO Manager in the CRO Procedures Manual and in the investment management agreements (“IMAs”) for each CRO investment manager.

Risk Budget: Volatility & Tracking Error Ranges (% Net Asset Value)

| Component | Annualized Volatility Expectation | Allowable Tracking Error |
|---------------------------|--|---------------------------------|
| Treasury Duration Capture | 12% - 24% | <= 3.0%/year |

The ERS is expected to manage the Systematic Trend Following and Alternative Return Capture component portfolios by stipulating a target for annualized volatility (i.e., annualized standard deviation) and a maximum value-at-risk limit for a one-day net asset value loss at a 5% confidence level (“VaR (5%)”) for each investment manager. The VaR threshold is the total daily loss amount that the daily return is expected to exceed on only 5% of trading days. It is typically based on the expected volatility of a portfolio.

The maximum drawdown threshold is based on a 5% confidence level for a loss of net asset value over a one-year horizon; at the CRO component level, this limit is only expected to be exceeded one year out of 20 years. Given that each CRO component’s volatility must be large enough to offset equity volatility, maximum drawdown limits at the individual manager level can be sizable. Overall drawdown risk within a specific component portfolio is the aggregation of several drawdown risks accepted by ERS’s investment managers as they implement their mandates. Key factors driving drawdown risk include: leverage level, position concentration, and correlations among risk premiums during market stress periods.

The allowable target volatility range, value-at-risk limit, and maximum drawdown limit for the Systematic Trend Following and Alternative Return Capture components are provided in the table below. These risk budgets may be further restricted by the ERS CRO Manager in the CRO Procedures Manual and extended to the investment management agreements for each CRO investment manager.

Risk Budgets – Key CRO Components (% Net Asset Value)

| Component | Annualized Volatility Range | VaR (5%) Limit | Maximum Drawdown Limit |
|----------------------------|------------------------------------|-----------------------|-------------------------------|
| Systematic Trend Following | 10% - 20% | 2.0% | -20% |
| Alternative Return Capture | 10% - 20% | 2.0% | -20% |

I.4. Manager Investment Guidelines

All investments and investment managers are subject to Section 88-119 (Investments), Hawai'i Revised Statutes, the Derivatives Policy in the Appendix of this section, and the following guidelines. Only the Treasury Duration Capture managers are subject to the Watch Criteria in the Appendix of this section. The ERS CRO Manager, in consultation with the CRO Platform Manager and ERS CIO, may further restrict these guidelines or add guidelines for an investment manager to control risks particular to that manager's style.

A. Treasury Duration Capture Manager Guidelines

| | |
|--|--|
| Approved Manager(s): | Ryan Labs Asset Management, Inc. Blackrock Financial Management, Inc. (Alternate) |
| All allowable securities are described in Section 88-119 (Investments), HRS, the Derivatives Policy in the Appendix of this section, and the following guidelines: | |
| Component: | Treasury Duration Capture |
| Benchmark: | Barclays Capital U.S. Treasury Long Index |
| Max. Tracking Error Objective: | 3.0% Annualized (applies only to Enhanced Index Strategy) Refer to appendix for Watch Criteria and Return Expectations |
| Volatility Range: | 12% - 24% expected annualized standard deviation |
| Security Allowances/Restrictions: | <ul style="list-style-type: none"> - The maximum gross leverage (the sum of the absolute values of the long and short notional positions) constraint will be addressed in each manager's IMA. - <i>Acceptable Securities:</i> Only cash, U.S. Treasury and Agency securities, and exchange-traded Treasury futures are allowed. - Specific security-type limits (as % of account net asset value): <ul style="list-style-type: none"> o U.S. Government Agency MBS Max. 10% o U.S. Government Agency Max. 20% o U.S. Treasuries (including futures) Min. 80% o Non-Benchmark Max. 20% - <i>Prohibited Securities:</i> All non-U.S. Treasury/Agency instruments. |
| Duration Range: | <ul style="list-style-type: none"> - Enhanced Index Strategy: +/-10% of the duration of the Benchmark. - Ryan Labs DRP Strategy: 0% - 150% duration of the Benchmark. |
| Ryan Labs Defensive Risk Premium ("DRP") Notional Limit: | 100% of account net asset value. |

B. Systematic Trend Following Manager Guidelines

| | |
|--|---|
| Approved Manager(s): | Aspect Capital Limited Campbell & Company, Inc. Crabel Capital Management, LLC Alpha Simplex Group, LLC (Alternate) |
| All allowable securities are described in Section 88-119 (Investments), HRS, the Derivatives Policy in the Appendix of this section, and the following guidelines: | |
| Component: | Systematic Trend Following |
| Benchmark: | MLM Global Index (15% Vol) |
| Target Volatility Objective: | 15% to 20% annualized standard deviation with specific target determined by ERS CRO Manager. |
| Value at Risk | VaR limits will be addressed in each manager's IMA. |
| Performance Objective: | Outperform the MLM Global Index (15% Vol) over rolling 5-year periods. |
| Maximum Drawdown Limit: | 1.5x Target Volatility |
| Security Allowances/Restrictions: | <ul style="list-style-type: none"> - Cash collateral will be invested only in high quality short-term (<1 years) money market/fixed income investments, including cash. - Derivatives will be utilized to establish numerous long and short positions in a wide array of global markets (see Derivatives Policy in CRO Policy Appendix). - All investments will be in highly liquid securities and of such size that they can be liquidated/closed at full market value (i.e., a value essentially equivalent to the most recent reported value) within two trading days. - <i>Acceptable Securities:</i> Exchange-traded futures, currency forwards and futures, total return swaps on highly liquid equity securities, currency/spot FX (cash), high quality/liquid money market and fixed income instruments; all investments must be consistent with 88-119. - <i>Prohibited Securities:</i> Any instrument not listed as an Acceptable Security. |

C. Alternative Return Capture Manager Guidelines

| | |
|--|---|
| Approved Manager(s): | Graham Capital Management, L.P. P/E Global LLC Welton Investment Management Mellon Capital Management Corporation (Alternate) |
| All allowable securities are described in Section 88-119 (Investments), HRS, the Derivatives Policy in the Appendix of this section, and the following guidelines: | |
| Component: | Alternative Return Capture |
| Benchmark: | 90-Day Treasury Bills + 5%/year |
| Volatility Objective | 15% - 20% annualized standard deviation with specific target determined by ERS CRO Manager. |
| Value at Risk | VaR limits will be addressed in each manager's IMA. |
| Market Correlation Objective | <0.30 correlation to public portion of ERS Broad Growth class over rolling 24-month periods. |
| Performance Objective | Outperform the Benchmark over rolling 5-year periods. |
| Maximum Drawdown Limit | 1.5x Target Volatility |
| Security Allowances/Restrictions: | <ul style="list-style-type: none"> - Cash collateral will be invested only in high quality short-term (<1 years) money market/fixed income investments, including cash. - Derivatives will be utilized to establish numerous long and short positions in a wide array of global markets (see Derivatives Policy in CRO Policy Appendix). - All investments will be in highly liquid securities and of such size that they can be liquidated/closed at full market value (i.e., a value essentially equivalent to the most recent reported value) within two trading days. - <i>Acceptable Securities:</i> Exchange-traded futures, currency forwards and futures, total return swaps on highly liquid equity securities, currency/spot FX (cash), high quality/liquid money market and fixed income instruments; all investments must be consistent with 88-119. - <i>Prohibited Securities:</i> Any instrument not listed as an Acceptable Security. |

CRISIS RISK OFFSET: APPENDIX

Derivatives Policy for CRO Class

Derivatives may be used in the CRO portfolio to access the risk premia inherent to the mandates comprising the CRO component portfolios; they may also be used as a substitute for a cash market security, risk control, income, cost reduction, or liquidity management. Derivatives are not permitted for purposes of speculation. **Any derivative investment not explicitly authorized below is prohibited.**

- Where derivatives are used as substitutes for a specific cash security or set of cash securities, the return volatility of the combination of the derivative and associated cash position shall be equivalent to the unleveraged cash security or securities underlying the derivative instrument.
- The Administrator for each CRO account shall mark-to-market their derivative positions daily.
- Permitted Instruments:
 - *Futures* – commodity futures, equity index futures, bond futures, money market futures, and currency futures where the manager has the authority to invest in the underlying or deliverable cash market security. No physical delivery can be taken in commodity futures.
 - *Currency forwards & spot FX.*
 - *Equity basket swaps* (total return swaps on individual equity securities, both long and short).
- Futures contracts must be CTFC (Commodity Futures Trading Commission) approved and exchange traded.
- All trading counterparties must be approved by the CRO Platform Manager and be rated investment grade as determined by at least one major rating agency.
- Cross-hedging is permitted.
- On a daily basis, the CRO Platform Manager shall examine all derivatives purchases of each CRO investment manager for prohibited derivatives. Should any prohibited derivatives be found, the Platform Manager should promptly notify ERS investment staff and instruct the investment manager to sell the prohibited derivatives.

Treasury Duration Capture Manager Watch Criteria and Implied Excess Returns (annualized)

| | | Tracking Error | | | | | | | | | |
|---------------------------------|------------------------------|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | | 0.50% | 1.00% | 1.50% | 2.00% | 2.50% | 3.00% | 3.50% | 4.00% | 4.50% | 5.00% |
| Short-Term (1-year) | Watch Threshold | -0.41% | -0.82% | -1.23% | -1.63% | -2.04% | -2.45% | -2.86% | -3.27% | -3.68% | -4.08% |
| | Implied Excess Return | 0.17% | 0.33% | 0.50% | 0.67% | 0.83% | 1.00% | 1.17% | 1.33% | 1.50% | 1.67% |
| Medium-Term (3-year) | Watch Threshold | -0.17% | -0.33% | -0.50% | -0.67% | -0.85% | -1.02% | -1.20% | -1.38% | -1.55% | -1.73% |
| | Implied Excess Return | 0.17% | 0.33% | 0.49% | 0.65% | 0.81% | 0.97% | 1.13% | 1.28% | 1.43% | 1.58% |
| Long-Term (5-year) | Watch Threshold | 0.995 | 0.991 | 0.986 | 0.981 | 0.976 | 0.971 | 0.966 | 0.961 | 0.956 | 0.951 |
| | Implied Excess Return | 0.17% | 0.33% | 0.49% | 0.65% | 0.81% | 0.96% | 1.12% | 1.27% | 1.42% | 1.57% |

| | | Tracking Error | | | | | | | | | |
|---------------------------------|------------------------------|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
| | | 5.50% | 6.00% | 6.50% | 7.00% | 7.50% | 8.00% | 8.50% | 9.00% | 9.50% | 10.00% |
| Short-Term (1-year) | Watch Threshold | -4.49% | -4.90% | -5.31% | -5.72% | -6.13% | -6.53% | -6.94% | -7.35% | -7.76% | -8.17% |
| | Implied Excess Return | 1.83% | 2.00% | 2.17% | 2.33% | 2.50% | 2.67% | 2.83% | 3.00% | 3.17% | 3.33% |
| Medium-Term (3-year) | Watch Threshold | -1.92% | -2.10% | -2.29% | -2.47% | -2.66% | -2.85% | -3.04% | -3.24% | -3.43% | -3.63% |
| | Implied Excess Return | 1.73% | 1.88% | 2.03% | 2.17% | 2.32% | 2.46% | 2.60% | 2.74% | 2.88% | 3.01% |
| Long-Term (5-year) | Watch Threshold | 0.946 | 0.940 | 0.935 | 0.929 | 0.924 | 0.918 | 0.912 | 0.907 | 0.901 | 0.895 |
| | Implied Excess Return | 1.71% | 1.86% | 2.00% | 2.14% | 2.28% | 2.42% | 2.55% | 2.69% | 2.82% | 2.95% |

Short-Term Criteria (for TDC mandates):

Performance below the threshold for 3 consecutive months.

Medium-Term Criteria (for TDC mandates):

Performance below the threshold for 6 consecutive months.

Long-Term Criteria (for TDC mandates):

VRR (Value Relative Ratio) below the threshold for 6 consecutive months.

VRR = manager cumulative return / benchmark cumulative return

The Watch Thresholds and Implied Excess Returns assume an **Information Ratio of 0.33**.

Rationale:

The establishment of an assumed information ratio (excess return / tracking error) is important in order to develop consistent active risk taking evaluation criteria across the portfolio. Investors should expect a positive return to active risk taking, or they should not do it.

Absolute returns to volatility (Sharpe ratio) for a traditional 60/40 portfolio over the long-term has been between 0.3 and 0.4, and was approximately 0.33 over the last 40 years. Intuitively then, if an uncorrelated active strategy could be isolated, it should be expected to contribute at this level of return to volatility in order to be additive to portfolio return to risk.

There is no certainty about future active returns, correlation of those returns to market risks, distributions of those active returns, or even the future return to market risks. Given all of this uncertainty, establishing an expected information ratio requirement for active managers to evaluate their performance is useful. A 0.33 information ratio across public market strategies provides a reasonable and objective level based on the considerations outlined above.