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3-2 Investments

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Effective: 9/18/2014

Board Policy:

THE INVESTMENT "ENDS"

This policy defines the desired outcome of the investment program. It will be the board's responsibility to carry out the following duties with the assistance of staff:

- 1) Develop a Real Return^[1] Objectives (RRO) that will keep contribution rates reasonably level over long periods of time absent changes in actuarial assumptions.
- 2) Establish an asset allocation policy that is expected to meet the RRO while minimizing the impact of the fund's volatility on the contribution rate. Secondary considerations include, but are not limited to, the expected rate of return for each asset class, the expected risk of each asset class, the correlation between rates of return among the asset classes, and the investment objectives and risk constraints of the fund.
- 3) Monitor costs associated with the efficient implementation of the asset allocation through the use of internal and external resources.

REAL RETURN OBJECTIVE

Based on actuarial assumptions adopted by the board on July 19, 2012, it is estimated that the portfolio must generate a compound annual real return on invested assets of 5.5% per annum in order for the System to accumulate the assets needed to meet benefit obligations while at the same time maintaining a level percent of payroll contribution rate.

POLICY AND STRATEGY ALLOCATION MIX

Based on the recommendation of the chief investment officer (CIO) and the chief general asset consultant (CGAC), and the Board's determination of its long-term return expectations, and the appropriate risk tolerance for the System, the Board, at the July 19, 2012 board meeting adopted the following risk weighted portfolio structure. Eighty percent of the fund's capital will be deployed in the *Beta Balanced* portfolio and twenty percent of the fund's capital will be deployed in the *Illiquid* portfolio.

BETA BALANCED PORTFOLIO - 80% OF CAPITAL

The Beta Balanced portfolio will pursue liquid exposure to five market betas and will seek to weight these betas equally based on long-term volatility estimates. One of our fundamental investment beliefs is that *"diversification is critical because the future is unknown."* It was this belief combined with our research that lead us to conclude that these five betas, equal risk weighted, would provide maximum diversification to the portfolio across various economic environments. The five betas included in Beta Balanced are public equities (represented by global equities), nominal bonds (represented by long treasuries), inflation indexed bonds (represented by 1-10 TIPS), commodities, and hedge funds, or alternative betas. Each of these asset classes has a benchmark that is believed to best represent the respective betas' diversification strength. Table 1 shows the Beta Balanced portfolio components.

TABLE 1

Beta Balanced Asset Classes	Risk Allocation	Risk Allocation	Benchmark Index
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(80% of total capital)	Policy	Ranges ^[2]	(weight) ^[3]
Equity	20%	13% - 27%	MSCI ACWI ^[4] (19%)
Long Treasuries	20%	13% - 27%	Barclays Long Treasury (37%)
TIPS	20%	13% - 27%	Barclays 1-10 TIPS (64%)
Commodities	20%	13% - 27%	GSCI ^[5] (17%)
Hedge Funds	20%	13% - 27%	AQR DELTA ^[6] (31%)

The following paragraphs describe permissible investments in each of the asset classes that make up MOSERS' Beta Balanced portfolio.

Equities (as represented by the public global stock market)

It is expected that investments in this class will perform well during periods of rising economic growth and/or falling inflation. Investments in this asset class may include U.S. and non-U.S. equity investments with varying characteristics related to market capitalization and investment style. Because of the non-U.S. nature of some of these investments, it is expected that non-dollar currency exposure will be part of this portfolio. Investments in this asset class might include, but are not limited to, specific sectors of the overall market, real estate investment trusts (REITs), master limited partnerships (MLPs), investment grade and high yield corporate credit, sovereign government debt that has an observable credit risk, high yield loans, investment grade, high yield and equity structured credit. Short selling is allowable in this asset class from time to time, primarily for rebalancing purposes. Instruments including physical securities, futures, swaps, options, forward contracts, reverse repurchase agreements and securities lending agreements may be utilized to obtain exposure.

The benchmark for this asset class is MSCI ACWI with USA Gross Index, net of actual leveraging cost on exposure achieved through borrowing.

Nominal Bonds (as represented by Long Treasuries)

It is expected that investments in this asset class will perform well in periods of falling economic growth and falling inflation. Investments in this asset class may include U.S. and non-U.S. bonds that have been issued, collateralized or guaranteed: (i) by the U.S. Government, it's agencies, or its instrumentalities (collectively known as U.S. Government Securities) or (ii) by investment grade non-U.S. Sovereign governments, their Agencies or their instrumentalities (collectively known as non-U.S. Government Securities). Because of the non-U.S. nature of some of these bonds, it is expected that non-dollar currency exposure will be part of this portfolio from time to time. Short selling is allowable in this asset class from time to time, primarily for rebalancing purposes. Instruments including physical securities, futures, swaps, options, forward contracts, reverse repurchase agreements and securities lending agreements may be utilized to obtain exposure.

The policy benchmark is the Barclays Long Treasury Index, net of actual leveraging cost on exposure achieved through borrowing.

Inflation Indexed Bonds (as represented by 1-10 TIPS)

It is expected that investments in this asset class will perform well during periods of falling economic growth and rising inflation. Investments in this asset class may include U.S. and non-U.S. bonds that have been issued, collateralized or guaranteed: (i) by the U.S. Government, it's agencies, or its instrumentalities (collectively known as U.S. Government Securities) or (ii) by investment grade non-U.S. sovereign governments, their Agencies or their instrumentalities (collectively known as non-U.S. Government Securities). All such securities must derive a significant portion of their value from changes in the respective issuer's domestic inflation. Because of the non-U.S. nature of some of these investments, it is expected that non-dollar currency exposure will be part of this portfolio from time to time. Short selling is allowable in this asset class from time to time, primarily for rebalancing purposes. Instruments including physical securities, futures, swaps, options, forward contracts, reverse repurchase agreements and securities lending agreements may be utilized to obtain exposure.

The policy benchmark is the Barclays 1-10 TIPS Index, net of actual leveraging cost on exposure achieved through borrowing.

Commodities

It is expected that investments in this asset class will perform well during periods of rising economic growth and rising inflation. Investments in the asset class may include derivatives or physical investments in raw materials, materials required in the manufacturing of finished products, the owners of raw goods, and the

producers of raw materials. Short selling is allowable in this asset class from time to time, primarily for rebalancing purposes. Instruments including futures, swaps, options, forward contracts, reverse repurchase agreements and securities lending agreements may be utilized to obtain exposure.

The policy benchmark is the Goldman Sachs Commodity Index (GSCI), net of actual leveraging cost on exposure achieved through borrowing.

Hedge Fund Beta

This asset class represents multiple hedge funds, or alternative betas that have been identified and are expected to produce positive risk premia. As a result of the multitude of strategies being deployed, it is expected that this asset class will provide meaningful diversification to the portfolio and should be expected to perform similarly across various economic environments and various inflationary environments. It is expected that exposure to this asset class will be achieved through investments in one or a combination of separate accounts, partnerships, commingled funds, fund of funds, and/or ETF's. Instruments including futures, swaps, options, forward contracts, reverse repurchase agreements and securities lending agreements may be utilized to obtain exposure.

The policy benchmark for this asset class is the return of the AQR DELTA Fund, net of management fees. AQR Delta is a product in which MOSERS invests that is expected to generate returns through pursuit of hedge fund beta.

Beta Balanced Risk Management

Beta Balanced does present its own unique set of risks. From a portfolio management perspective, unlike with a traditional asset portfolio where the primary risk is equity concentration risk, the primary risk of a beta balanced portfolio is its leverage. While the beta balanced portfolio uses market risk more efficiently, if experienced correlations between the asset classes are higher than the expected correlations, beta balanced portfolios can dissappoint and, if the leveraging applied in the beta balanced framework is too high, a beta balanced portfolio could experience losses that exceed expectations. The best hedge against this scenario is a prudent limit on leveraging and, just as importantly, a large cash portfolio, which provides a good hedge in a market drawdown scenario.

Put another way, liquidity is much more important in a beta balanced portfolio than in a more traditional portfolio. In recognition of this, the Board has adopted the following leveraging limit, initial cash buffer, and cash replenishment guidelines.

TABLE 2

Beta Balanced Portfolio Guardrails
Leveraging limit = 1.25 times beta balanced capital
Initial Cash buffer = 25% of leveraged capital (within replenishing guidelines)

The cash portfolio will be monitored daily and replenished according to the guidelines in table 3.

TABLE 3

	Cash Portfolio as a Percentage of Synthetic Capital in the Beta Balanced Portfolio	Replenishing Guidelines
Range 1	25% or more	No changes
Range 2	24% to 16%	Develop action plan to replenish to Range 1 within 12 months
Range 3	15% to 11%	Develop action plan to replenish to Range 2 within 1 month, and subsequent plan to replenish to Tier 1 in 12 months
Range 4	10% or less	Take immediate action to replenish to Range 3, and subsequent plan to replenish to Tier 2 within 1 month, and

		subsequent plan to replenish to Range 1 within 12 months
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ILLIQUID PORTFOLIO – 20% OF CAPITAL

The illiquid portfolio will pursue exposure to investments that are expected to capture the illiquidity risk premium. This premium can be thought of as simply another exploitable beta. The beta in this case is the extra return an investor expects to receive for locking their capital up for an extended period of time. Most investments in this portfolio will be locked up for a minimum of five to seven years and ten plus year investments are not uncommon. In addition to the expectation of an illiquidity premium, MOSERS also expects managers in this portfolio to generate alpha from specialized expertise in the strategies they employ. As a result, investments in this category come with a blend of beta and alpha seeking.

Private investments across the capital structure including equity and debt are expected in this portfolio. To acknowledge the importance of building a diversified portfolio across economic environments, the Board adopted a policy that targets half (50%) of this portfolio to be employed in strategies that are expected to perform well in rising economic growth environments, while the other half (50%) is to be deployed in strategies that are expected to perform well during periods of rising inflation. Investment styles may include buyout, distressed, venture, secondaries, debt origination and other forms of lending as examples. Some partnerships may be focused on economic activity outside the U.S. for returns. As a result, it is expected that this portfolio will have foreign currency exposure from time to time. It would also be expected that partnerships focused on various sectors of economic activity including consumer, real estate, natural resources, infrastructure, royalty streams etc. will be necessary in order to achieve the type of overall diversification this portfolio seeks. While the majority of the assets in this portfolio will be illiquid it is expected that this portfolio will generate enough cash (in the form of partnership distributions) to pay its pro-rated share of the retirement benefit payments and to reinvest proceeds in order to maintain its approximate 20% weight as a percentage of total capital.

The policy benchmark for this portfolio is the return of the S&P 500 plus 3%. The 3% above the market is in recognition of the illiquidity premium discussed above. The following table identifies expectations for the Illiquid portfolio.

TABLE 4

Illiquid Portfolio (20% of total capital)	Benchmark Index (weight)
Growth Sensitive	S&P 500 + 3% (10%)
Inflation Sensitive	S&P 500 + 3% (10%)
Illiquid Portfolio upper limit of 27.5% of capital, no new commitments past 23%	

COMPONENTS OF INVESTMENT RETURN – Beta and Alpha Separation

One of MOSERS investment beliefs is that *“every investment should be examined in the context of its two distinct return components – beta and alpha”*

The Beta Balanced Portfolio is our best attempt to create an efficient, low cost, beta portfolio. Beta exposure is expected to capture risk premia available to all investors for making investments in risk bearing assets. Management fees associated with beta seeking strategies are very low.

Alpha is the portion of the return that is attributable to practitioner skill. Unlike beta, where investors expect to receive a reward just for showing up, in the world of alpha there are winners and losers with the sum of those netting to zero alpha. In reality the sum is below zero because of the management fees and trading costs associated with alpha seeking. In most instances investors have a choice as to whether they wish to pursue alpha in their portfolio management strategy; however in the Illiquid Portfolio alpha/beta separation is not possible and, as stated in footnote #4, in the hedge fund beta portfolio alpha and beta components are currently difficult to separate.

MOSERS has sought and successfully generated positive alpha for several years. A variety of implementation strategies have been utilized in seeking alpha within the portfolio. These strategies include strategic asset allocation (conducted by internal staff) and external active management. MOSERS internal staff seeks alpha by implementing decisions to overweight and underweight asset classes and sectors within asset classes based upon relevant valuation, momentum and mean reversion data. The board has granted the CIO the authority to alter the equal risk weighted allocation policy to pursue alpha. This authority exists within risk ranges as depicted in Table 1. The risk ranges, like the policy allocation, are driven by long-term volatility expectations for the five betas that make up the beta balanced portfolio. The CIO will make these strategic allocation decisions away from the policy benchmark subject to consultation and agreement from the CGAC.

Beyond strategic asset allocation, MOSERS hires specialty external managers who rely on individual security selection, among other things, in order to generate alpha relative to their benchmark. Because individual security selection is at the heart of what most of these managers do, they must purchase and/or sell the majority of their positions in the cash market which drains liquidity from the MOSERS overall portfolio. Because of the cash (liquidity) demand that Beta Balanced places on its implementation, combined with the fact that the existence of the Illiquid Portfolio also demands cash, the expected alpha hurdle for specialty external

managers inside Beta Balanced is raised. While some capital will be available for external specialty managers, it is expected that their contribution to total alpha in the future will be reduced.

PERFORMANCE MEASUREMENT

The long-term real return objective (RRO) of the investment portfolio is to generate 5.5% per annum. The RRO is the rate by which the total return exceeds inflation. The success in achieving the RRO should be evaluated over full economic cycles. While the length of economic cycles will vary, minimally a five year window will be utilized to measure success with full recognition that seven to ten years is a more relevant time frame. The reason for the long-term focus on this objective is to preclude the temptation to overreact to events in the marketplace that have little or no relevance to the long-term nature of the System's liabilities and therefore the investments being made to fund those liabilities.

From a performance perspective, the resulting dilemma is the conflicting need to evaluate investment decisions over shorter time frames (to fulfill fiduciary goals) while maintaining the longer-term focus necessary to manage and measure the fund's performance relative to the RRO.

To address this dilemma, the board has established the following categories to measure performance:

Policy - Board Approved / CIO-CGAC Recommended / ED Compliance

- Strategy - Board Delegated / CIO Recommended / CIO-CGAC Approved / ED Compliance
- Implementation – Board Delegated / Staff Recommended / CIO-CGAC Approved / ED Compliance

Policy Decisions

The value added through policy decisions is measured by the difference between the Policy Benchmark return and the Required Rate of Return Objective (defined as real rate objective plus the actual inflation^[1]). This difference captures the value added policy asset allocation decisions relative to the required rate of return objective necessary to meet the actuarial assumptions. A Policy Benchmark return greater than the Required Rate of Return Objective reflects value added. A Policy Benchmark return less than the Required Rate of Return Objective reflects a shortfall in the performance funding the liabilities of the System. These policy decisions are measured over periods of five years and longer.

Strategy Decisions

The value added through strategy decisions is measured by the difference between the Strategy Benchmark return and the Policy Benchmark return. This difference captures the value added by strategic decisions relative to the broad policy allocation. A Strategy Benchmark return greater than the Policy Benchmark return reflects value added from an alternative weighting relative to the Policy target or an alternative asset mix relative to Policy or a combination of the two. A Strategy Benchmark return less than Policy Benchmark return reflects value detracted from an alternative weighting relative to Policy target or an alternative asset mix relative to Policy or a combination of the two. Strategy decisions should be evaluated most closely over periods of three years and longer.

Implementation Decisions

The value added through implementation decisions is measured by the difference between the Actual Portfolio return and the Strategy Benchmark return. An Actual Portfolio return greater than the Strategy Benchmark return reflects value added through active manager selection decisions. An Actual Portfolio return less than the Strategy Benchmark return reflects value detracted from the fund's performance by active manager selection decisions. Implementation decisions should be evaluated most closely over periods of three years and longer.

PERIODIC REPORTS:

The board will monitor the performance and risk of the portfolio through periodic reports.

- 1) Quarterly, the CIO or his designee will present a report to the board addressing the System's success or lack thereof in accomplishing the investment "ends" based on the benchmarks described within this policy at the total fund level and asset class levels. This report will cover performance attribution at the policy, strategy and implementation levels.
- 2) Quarterly, the Head of Risk Management or his designee will present a report to the board addressing portfolio risk management findings and initiatives. Minimally the report will include a report on fund leveraging levels, cash levels, cash replenishment initiatives and various other risk statistics compiled by the investment department.
- 3) Annually, at the September board meeting, the CIO or his designee will present an asset allocation report to the Board that covers performance for the previous fiscal year, strategic positioning of the portfolio, implementation changes during the previous year, and the CIO's opinion as to the continued appropriateness of the asset allocation. During years in which a formal asset allocation study is conducted this report will be replaced by the formal study report.
- 4) Annually, a representative of Cost Effectiveness Measurement or another external consultant shall report to the board regarding the System's success or lack thereof in minimizing investment implementation cost without negatively impacting performance. At least every five years, or at Board or CIO request, a formal asset allocation study will be conducted and reported to the Board no later than the summer educational conference of that year.

[1] The real return objective is the rate by which the total return exceeds the inflation rate as measured by the Consumer Price Index, U.S. City Average for All Urban Consumers (CPI-U).

[2] The board has granted the CIO the authority to alter the equal risk weighted allocation policy. This authority exists within risk ranges as depicted in the table above. These risk ranges, like the policy allocation, are driven by the long-term volatility expectations for the five betas that make up the beta balanced portfolio. The CIO will make these strategic allocation decisions away from the policy benchmark subject to consultation and agreement from the CGAC.

[3] Benchmarks are net of MOSERS' actual leveraging costs on borrowed assets with the exception of the hedge fund benchmark which is net of management fees.

[4] Morgan Stanley Capital International All Country World Index with USA Gross Index.

[5] Goldman Sachs Commodity Index.

[6] A diversified risk balanced portfolio of liquid hedge fund premia managed by AQR Capital net of management fees.

[7] Because of the relative newness of institutional investing in hedge funds, the way in which they are included in portfolios is evolving. Traditional assets classes, like equities, bonds and commodities have evolved to the point that beta and alpha have been separated. Investors are offered products that are expected to capture beta exposure at a low cost and also have available to them products that pursue alpha (at a much higher fee). A similar separation process is beginning to take shape in the hedge fund industry. Leaders in the field of hedge fund beta have identified multiple factors with positive expected risk premia that hedge funds seek to capture. The identification of these risk premia have allowed for the creation of products whose objective is to capture these premia at a cost to the investor that is well below the typical hedge fund fee. MOSERS allocation to hedge fund betas recognizes the trend that is taking shape in this area and expects that over time, it will become easier for institutional investors to have a choice of low cost beta and/or high cost alpha. For a period of time it is expected that our allocation to this asset class will contain elements of beta and alpha that will be difficult to separate.

[8] Actual inflation is measured as the annualized level of the Consumer Price Index, U.S. City Average for All Urban Consumers (CPI-U), Non-Seasonally Adjusted (NSA).

[6/20/2013 Governance Policy](#)

[11/15/2012 Governance Policy](#)