Investment Committee

California Public Employees' Retirement System

Agenda Item 6a

September 10, 2012

ITEM NAME: Quarterly Risk Management Update

PROGRAM: Total Fund

ITEM TYPE: Asset Allocation, Performance & Risk – Information

EXECUTIVE SUMMARY

The purpose of this item is to provide a quarterly report on the Total Fund investment risk to the Investment Committee. The report provides analysis on the quantitative market risk metrics such as total risk, contributions to total risk, active risk, asset class risk and risk trends as of June 30, 2012. These metrics are stated in Standard Deviations (SD) and Value-at-Risk. The report also provides regional and currency exposures and risk contributions across the Total Fund. All of the above measures are derived from the BarraOne Risk System. Additional risk measures such as leverage, counterparty risk and liquidity are also provided and are calculated separately by staff.

The forecast total risk level has decreased from the prior quarter (15.8% to 14.9%) although is higher than the 11.9% estimate used in the 2010 Asset Liability Management (ALM) Workshop. The current Total Fund forecast active risk is equivalent to the target (1.49% versus 1.50% target). Leverage across the Total Fund is within respective limits and counterparty exposures are being actively monitored.

BACKGROUND

The BarraOne Risk System has been in place since December 2011. This risk system provides a comprehensive and consistent quantitative risk assessment across the Total Fund.

Recent capabilities which improve our ability to assess the Total Fund Portfolio include:

- 50% increase in coverage of private assets since implementation
- Characterizing an additional 7,000 private companies
- Risk forecasting model for private core U.S. real estate
- Risk forecasting model for private equity holdings (in test mode)

Staff has summarized the most recent Total Fund risk report based on reconciled holdings as of June 30, 2012 in the attached presentation (Attachment 1).

In addition to the market risk metrics generated by the BarraOne Risk System, Risk Management staff also report on the following risk metrics:

- CalPERS Leverage
- CalPERS Derivative Counterparty Exposure
- CalPERS Liquidity Analysis

ANALYSIS

Total Fund Projected Risk

Total one year forecast risk is 14.95% which represents one SD as of June 30, 2012. Total risk (Attachment 1, slide 2) is a combination of benchmark risk (14.05% SD) and active risk (1.49% SD). The two components of total risk are not additive due to correlation effects. Benchmark risk is the estimated volatility for the CalPERS policy portfolio. The active risk is the excess risk over the benchmark due to implementation effects. The estimated risk of the policy portfolio at the 2010 ALM Workshop was 11.9% SD (long-term) compared to the risk system's one year forecast of 14.05% SD (one year). Recent market volatility and correlations have been higher than long-term averages, increasing the forecast risk of the policy portfolio.

The total risk of 14.95% SD means that there is a 68% probability that the expected one year return of the Total Fund will be in the range of -7.57% to +22.33%, which is determined by taking the expected return of 7.38% +/- 14.95% SD (Attachment 1, slide 3).

The time series for the Total Fund risk and benchmark risk is shown on Attachment 1, slide 4. Both measures rose sharply in the fourth quarter of 2008 and peaked in early 2009 when the risk model fully incorporated the extreme volatility from the 2008 market crisis. Market volatility has generally declined in the ensuing period until the most recent spike in the second quarter of 2012 due to concerns of an economic slowdown, and the European debt crisis. Market variability as measured by the Chicago Board Options Exchange Volatility Index (VIX) has declined to below 15%.

Total Fund active risk spiked up during the financial crisis as sharp equity drawdowns caused the asset class allocations to deviate significantly from the policy targets and higher asset volatility also impacted the active risk (Attachment 1, slide 5). Small asset allocation deviations can result in higher active risk during periods of high market volatility. The forecast active risk has moved down recently to 1.49% which is slightly below the 1.5% active risk target. The change in forecast active risk has been driven by decreased correlation between assets.

The actual asset class weights (dollar allocation) and their respective contribution to total risk are shown on Attachment 1, slide 8. As indicated in prior reports, Global

Equity and Private Equity contribute a much higher share to total risk than their allocation weights. This is due to the higher volatility of these assets and a degree of positive correlation to some of the other assets in the Total Fund. The growth assets (Global Equity and Private Equity) account for 64% of total assets and 87% of total risk. Real Assets account for 10% of total assets and contribute 10% of total risk. Global Fixed Income (GFI), Inflation Linked Bonds, Liquidity and Commodities each contribute less to the Total Fund risk than their allocation weights. Together these assets account for 25% of the Total Fund assets and contribute only 2% to total risk. The reason for having higher allocations and risk contributions from Global Equity and Private Equity are their higher expected return, as determined in the 2010 ALM Workshop.

Asset Class Contribution to Total Risk

Asset class total and active risk is shown in Attachment 1, slide 9. Although Global Equity is the highest contributor to total risk, the forecast active risk is small, at 0.3% SD. The Global Equity portfolio is primarily index oriented, with active management representing about 29% of the asset class. A low active risk level means that the expected excess return from Global Equity is also small. Active risk in the Global Fixed Income portfolio has come down to 0.74% from a high of 4.0% during the financial crisis. Additionally, the Global Fixed Income portfolio implementation is now closer to its benchmark.

The highest active risk levels are in the private asset classes since the actual portfolios are very different from the benchmarks. These portfolios do not seek to be benchmark oriented, nor is it possible or desirable to do so. The reason for having allocations to these asset classes is to generate higher absolute returns. These asset classes are less efficient than the public asset classes and present more opportunities to add value. Forecast active risk for Private Equity (7.1% SD) and Real Assets (6.1% SD) are consistent with the level of active management.

Regional / Currency/ Industry/ Corporate Exposures

Regional exposures and their risk contributions are provided in Attachment 1, slide 10. The risk contribution from U.S. exposure is lower than the weight of the assets. The risk contribution from non-U.S. assets exceeds their actual asset weights. In particular, the assets in emerging markets and the European Monetary Union (EMU) areas have the largest relative risk contributions. The lower risk weighting from U.S. assets is largely due to the reduced correlation and volatility of the Fixed Income, Real Asset and Liquidity asset classes which are primarily held in U.S. dollars. A similar pattern exists in the currency allocation and risk contribution shown on Attachment 1, slide 11.

Industry exposures and company exposures are depicted on Attachment 1, slides 12 and 13. This analysis includes the effect of the currency overlay which reduces active risk by 9.7% by hedging part of the non-dollar exposure.

<u>CalPERS Leverage</u>

The total borrowing including recourse debt, non-recourse debt and notional leverage (e.g., derivatives contracts) totals $31.5 billion. The leverage report also includes items that are not formal borrowing, but do represent obligations of the fund and are therefore reported. Contingent claims from the credit enhancement program are $1.6 billion. Unfunded commitments for Private Equity and Real Estate amount to $20.9 billion.

All programs are in compliance with their leverage limits as of June 30, 2012 (Attachment 1, slide 15).

<u>Derivative Counterparty Exposure</u>

The derivative counterparty exposure report in Attachment 1, slide 16, summarizes net amounts owed to or due from CalPERS investment counterparties. Amounts are aggregated for currency forwards, options, swaps and To Be Announced (TBA) securities. TBA securities are forward settled mortgage-backed securities. Amounts owed to CalPERS result in counterparty risk. As of July 31, 2012, CalPERS was owed $137 million in net exposure by its counterparties.

Staff has been proactively reducing the counterparty exposure to certain financial institutions. This risk has been reduced primarily due to internal portfolio management choices as well as guidance to external managers.

All programs are in compliance with counterparty rules in investment policy as of July 31, 2012.

<u>Liquidity Analysis</u>

An updated liquidity schedule is included in Attachment 1, slide 17. This liquidity analysis incorporates trading volumes to estimate market impact. This schedule indicates that the fund can convert up to 16% of total assets, or $38 billion, to cash within a week, under normal trading conditions. Staff notes that trading volumes continue to decline, and that market liquidity is not as favorable as in recent years. This is occurring in equities as well as corporate fixed income.

ATTACHMENTS
Attachment 1 – CalPERS Total Plan Investment Risk Analysis

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