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March 15, 2010

AGENDA ITEM 5e

TO: MEMBERS OF THE INVESTMENT COMMITTEE

- I. SUBJECT:** Roles of Asset Classes in Strategic Allocation
- II. PROGRAM:** Asset Allocation/Risk Management
- III. RECOMMENDATION:** Information
- IV. ANALYSIS:**

Summary

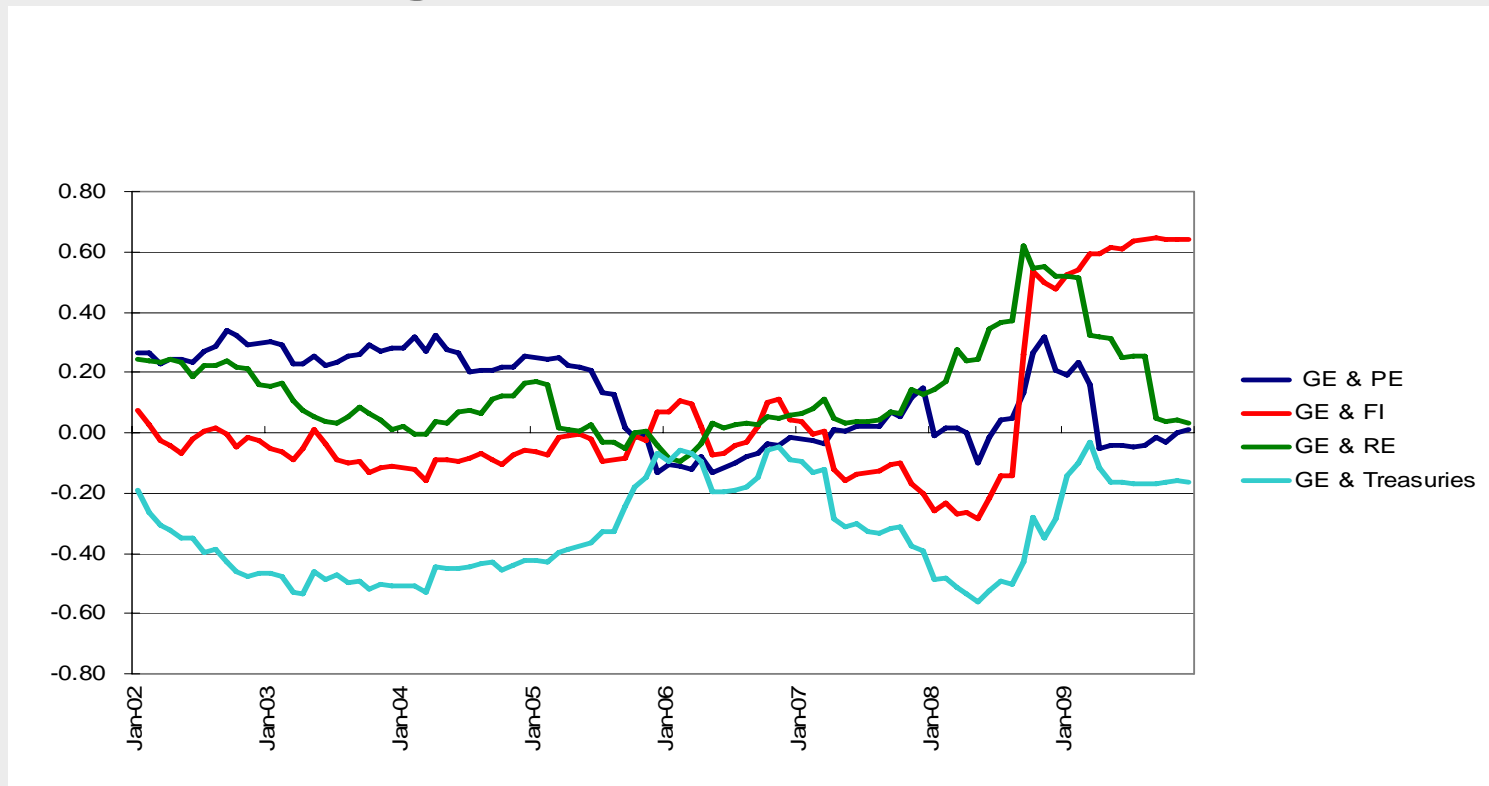
The purpose of this item is to discuss the role of asset classes in the strategic asset allocation process with the Investment Committee (IC). Staff has outlined a three step process for the 2010 Asset Liability Management (ALM) review:

1. Role of asset classes in the strategic allocation
2. Capital market assumptions
3. ALM process and methodology

Staff will discuss steps two and three with the IC at subsequent meetings. A cross asset class staff team along with Board consultants from Wilshire Consulting and PCA worked on the role of asset classes project and developed an alternative classification of assets based on their fundamental characteristics. Analysis is in Attachment 1 and opinion letters from Wilshire and PCA are presented as Attachments 2 and 3 respectively.

As suggested by the consultants, there are alternative ways to classify some of the assets, particularly real estate and high yield. Staff believes that the classification in Table 2 is based on the analysis presented. However, the suggested alternatives are worthy of consideration by the IC. Staff will be prepared to discuss the alternatives and seek direction from the IC.

Correlation of Global Equity and Other CalPERS Asset Classes – Rolling Three-Year *(Period ending December 2009)*



- Fixed Income, AIM and Real Estate correlations with equity rose sharply during the market crisis
- Fixed Income correlation post crisis is higher than normal
- AIM and Real Estate correlations are based on smoothed data and hence understated

Economic Scenarios and Real Asset Returns

Growth

Inflation

Rising

Public Equities
 Private Equity
 Real Estate/REITS
 Commodities
 High Yield
 Corporate Spreads

Commodities
 Inflation Linked Bonds

Falling

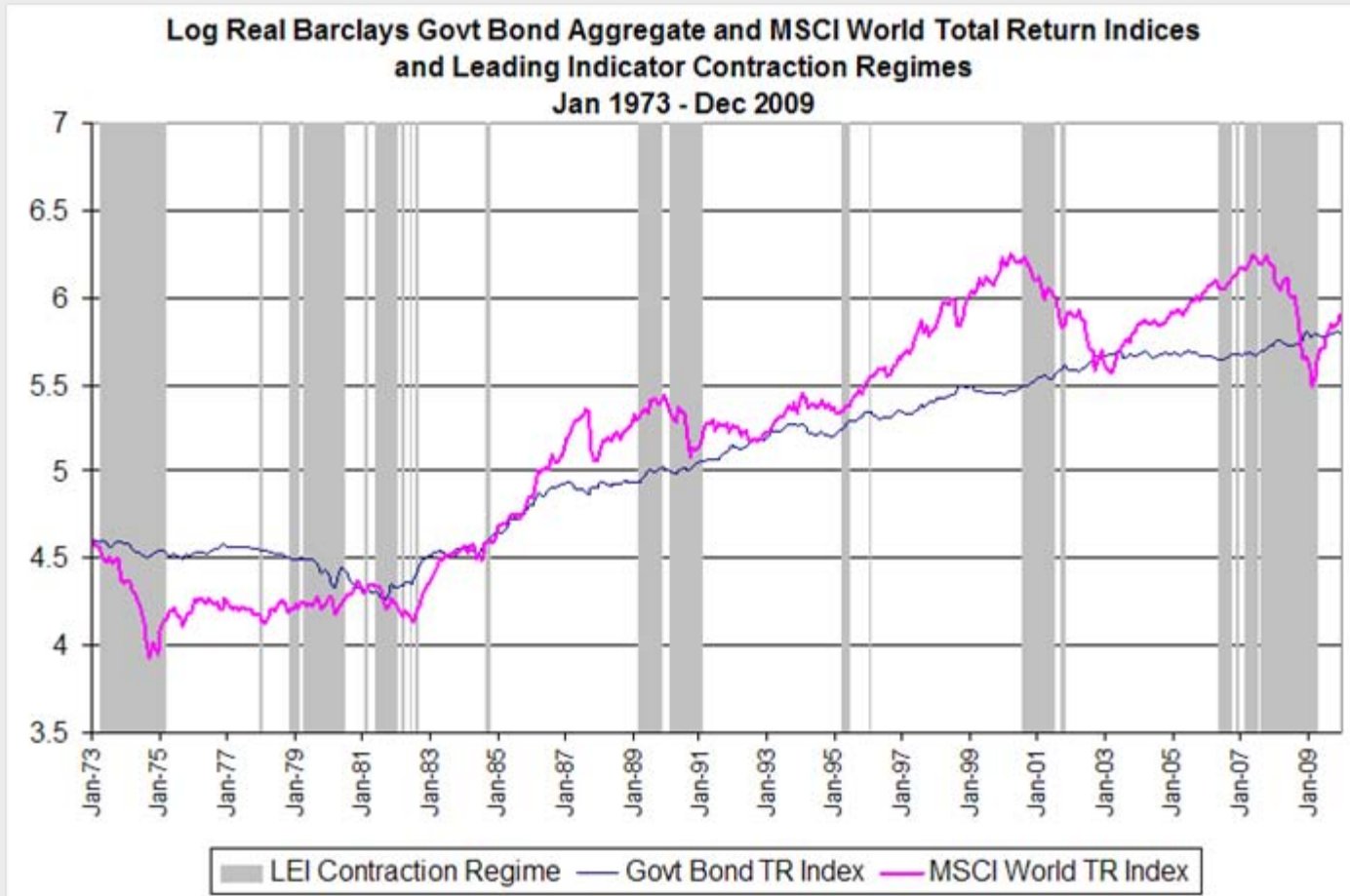
Government Nominal Bonds
 Inflation Linked Bonds

Public Equities
 Private Equity
 Real Estate/REITS
 Corporate Spreads
 Government Nominal Bonds

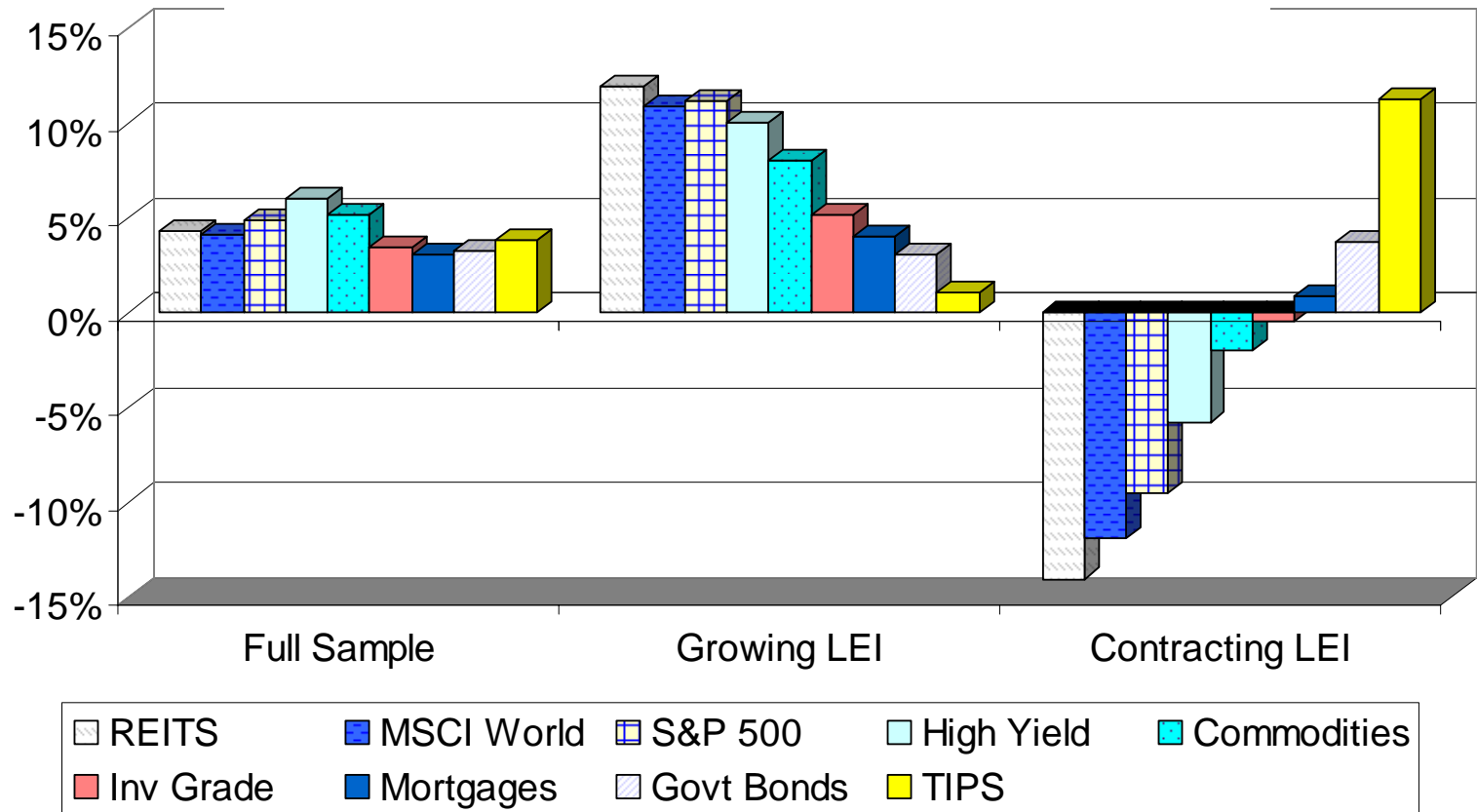
Economic Growth and Asset Returns

- For Public Equity, Private Equity, Real Estate, and High Yield, real return is on average negative if leading economic indicators are pointing downward
- Forward looking financial markets move ahead of actual GDP growth, but are coincident or slightly behind leading economic indicators
- Government bonds (nominal) and inflation-linked bonds have relatively insensitive performance over the business cycle
- Periods of high inflation have coincided with sub-par real returns for all assets except commodities and inflation-linked bonds

Equities and Government Bonds Under Economic Regimes

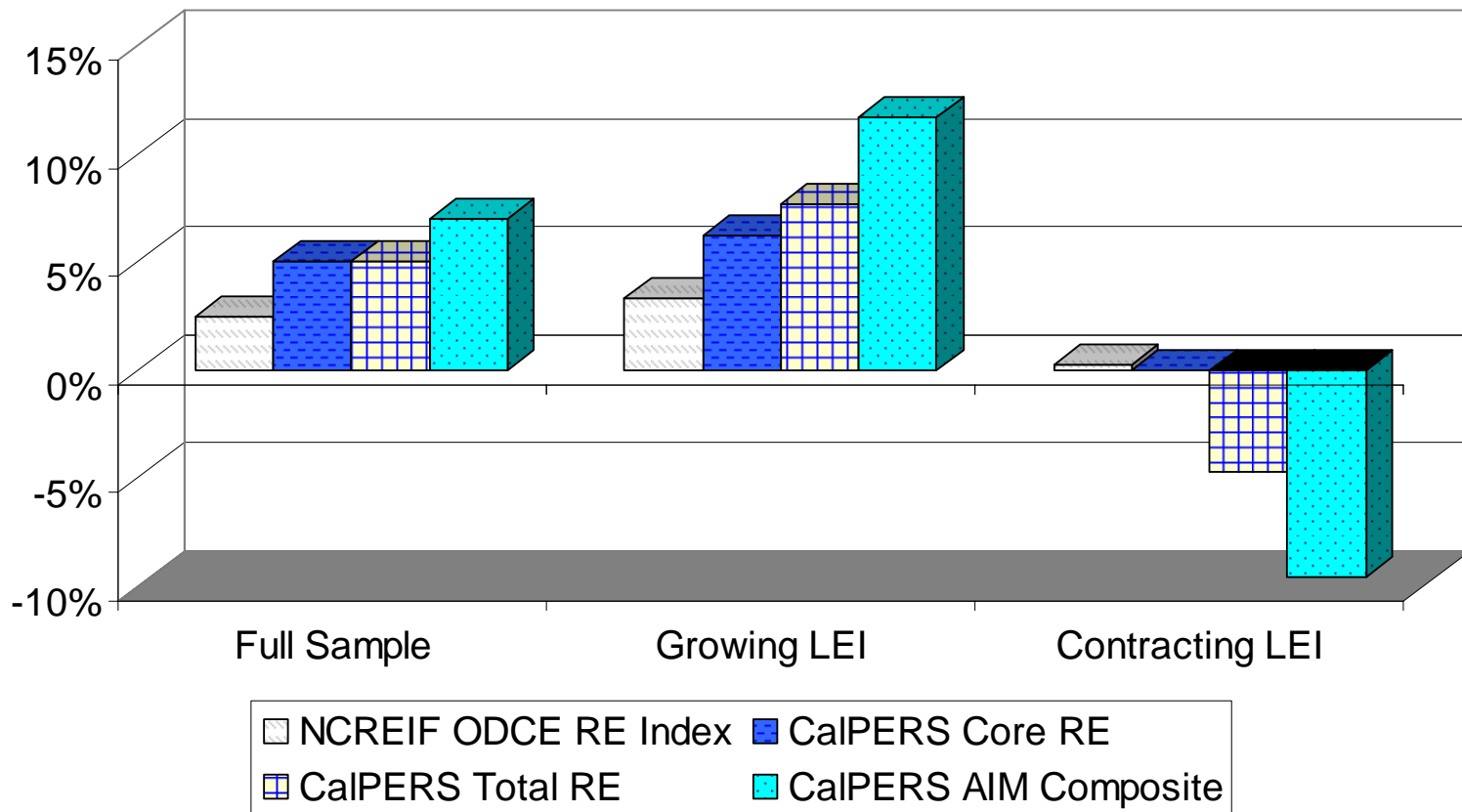


Real Annual Returns* by LEI Regime



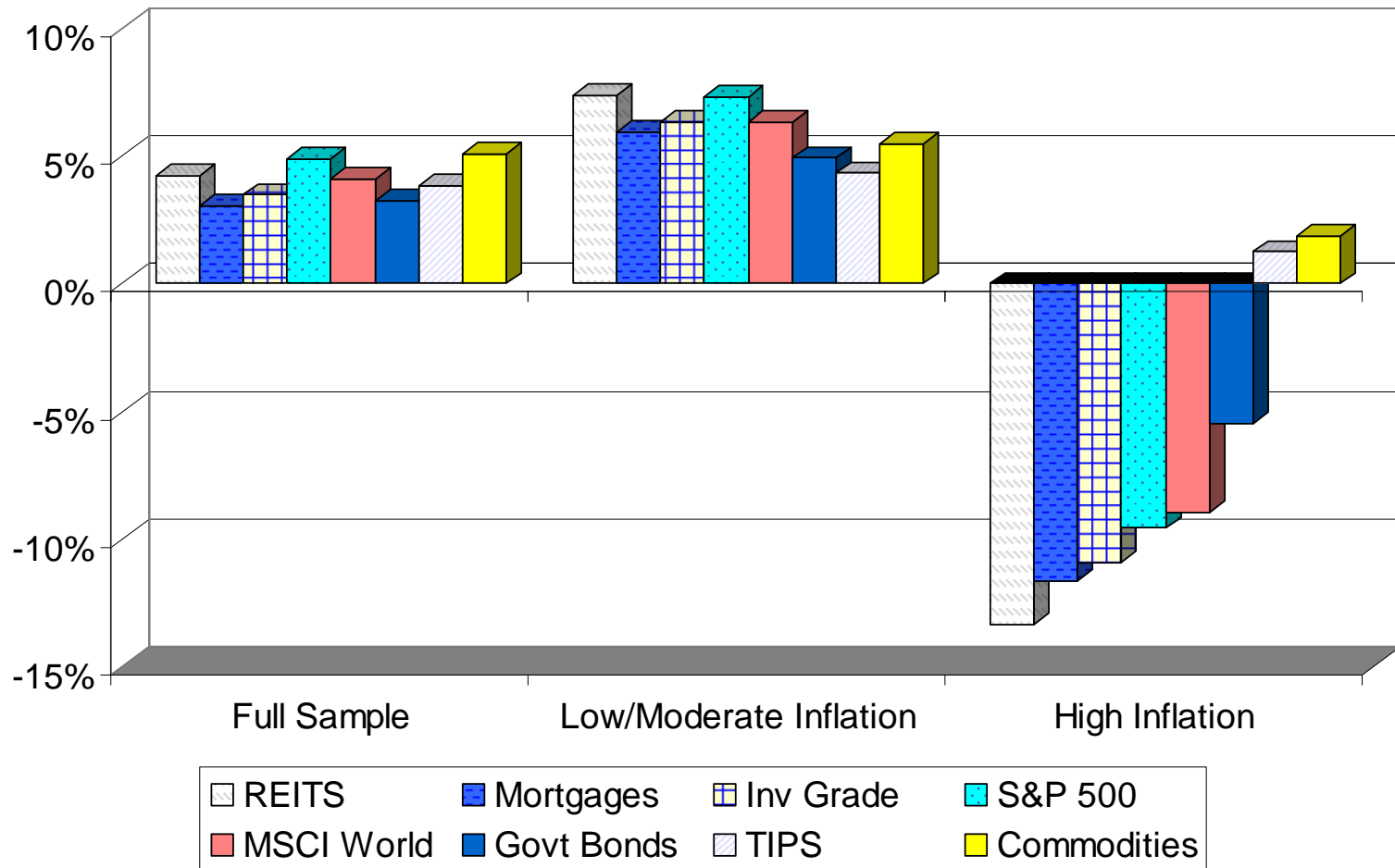
*Geometric returns

Real Annual Returns* by LEI Regime for CalPERS Real Estate and AIM



*Geometric returns

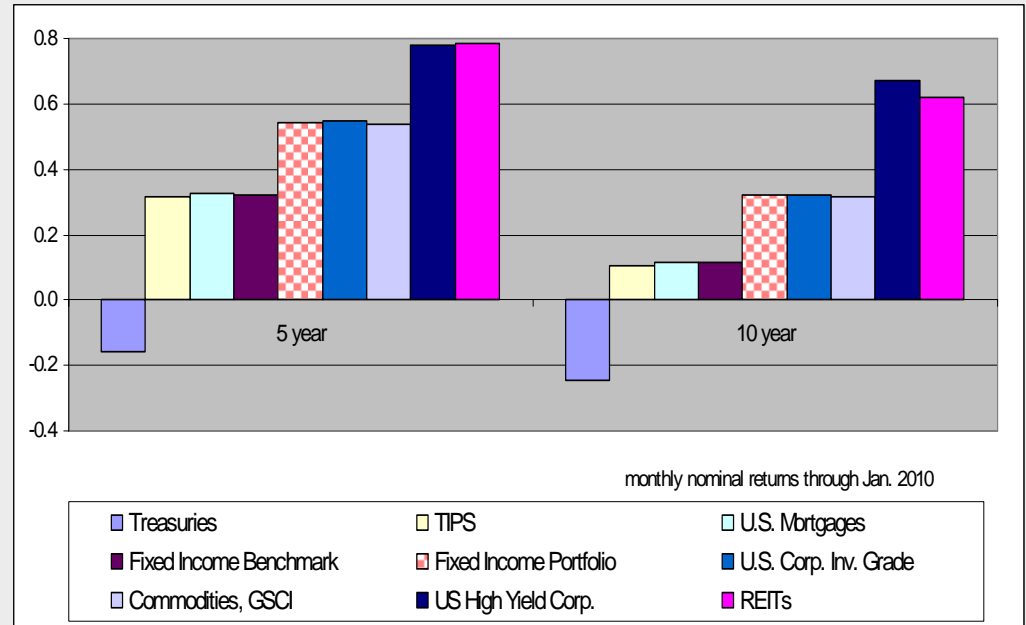
Real Annual Returns* by Inflation Regime



*Geometric returns

Fixed Income Correlations versus Global Equity

- Treasuries have strongly diversified equity risks
- Inflation-linked bonds were a less effective hedge than Treasuries during this disinflationary period
- The CalPERS fixed income portfolio has not diversified equity risk as well as its benchmark
- High yield bonds were poor equity diversifiers
- 20-year correlations are similar to the 10-year numbers shown to the right



Current Asset Classes

Asset Class	Risk Exposures
Public Equity	Growth
Private Equity (AIM)	Growth
Fixed Income	Mainly Growth except Government Bonds
Real Estate	Growth
Inflation-Linked	Inflation
Cash	Liquidity

Alternative Classification

Asset Classification	Building Blocks	Primary Objectives
Government Bonds	1. Government nominal bonds 2. Government inflation linked bonds	<ul style="list-style-type: none"> • Diversify Growth Assets • Hedge Liabilities • Provide Liquidity
Income	3. Investment grade spread sector bonds (corporate bonds, mortgages, other asset backed securities), securities lending, credit enhancement	<ul style="list-style-type: none"> • Outperform govt. bonds
Growth	4. Public Equities 5. Private Equity (AIM) 6. Real Estate 7. High Yield Bonds	<ul style="list-style-type: none"> • Achieve high returns from economic growth, subject to prudent risk
Inflation-Linked	8. Infrastructure, forestland, 9. Commodities	<ul style="list-style-type: none"> • Hedge Inflation Risk • Hedge Risk of Commodity Price Spikes
Market Neutral	10. Absolute Return: Hedge funds and all strategies with low asset class beta	<ul style="list-style-type: none"> • Materially outperform cash • Generate stable returns
Liquidity	11. Short-term high-quality fixed income securities	<ul style="list-style-type: none"> • Provide Liquidity

Advantages of Alternative Classification

- Considers fundamental economic risk factors and exposures
- More effective risk diversification under varying economic scenarios; diversifies current high growth exposure
- Allows greater focus on liabilities, liquidity and income returns
- Could allow for risk based dynamic implementation of the strategic allocation
- Establishes a separate allocation for RMARS, in recognition of its distinct risk/return profile
- Major disadvantage is lower expected returns from higher government bond, inflation-linked bond allocations

Main Questions for Discussion

1. Does the IC agree with the proposed framework for asset classification?
2. Does the IC agree with the proposed roles for the distinct fixed income portfolios as opposed to the current single fixed income asset class?
 - Government bonds – Separate as a growth risk hedge/liquidity
 - Investment grade – Income
 - High Yield bonds – Growth or income
3. Does the IC agree on the proposed classification of Real Estate?
 - a) Real Estate – Growth (current strategy) or
 - b) Real Estate – Income (modified strategy) or
 - c) Core Real Estate – Income
Non-core Real Estate – Growth

Asset Returns Under Economic Regimes

Jan 1970 - Dec 2009

Average Monthly Real Returns

	Total Sample	High Growth	Low Growth	High Inflation	Med Inflation	Low Inflation	Sample
Public Equities							
S&P 500 Total Return	0.50%	0.94%	-0.69%	-0.69%	0.29%	0.93%	1/70 - 12/09
MSCI World Total Return	0.42%	0.93%	-0.94%	-0.68%	0.27%	0.77%	1/71 - 12/09
Fixed Income							
Barclays Govt Aggregate	0.28%	0.26%	0.32%	-0.45%	0.24%	0.49%	2/73 - 12/09
Barclays Inv Grade Aggregate	0.31%	0.43%	0.07%	-0.91%	0.29%	0.64%	2/73 - 12/09
Barclays High Yield	0.53%	0.82%	-0.43%	N/A	-0.04%	0.76%	8/83 - 12/09
Barclays Credit - Mortgages	0.27%	0.34%	0.10%	-0.99%	0.25%	0.61%	2/73 - 12/09
Barclays & Synthetic 10yr TIPS*	0.37%	0.13%	0.98%	0.22%	0.22%	0.50%	1/70 - 12/09
FTSE NAREIT	0.49%	1.02%	-0.89%	-0.91%	0.12%	1.02%	2/72 - 12/09
GSCI Commodity Index	0.58%	0.75%	0.14%	0.40%	1.59%	-0.02%	2/70 - 12/09

*TIPS series prior to 1997 simulated using nominal 10 yr yields and estimated inflation expectations

CalPERS Real Estate and AIM Performance Under Growth Regimes – Real Returns

March 1978 - December 2009

	Average Quarterly Real Return	Avg Quarterly Return High Growth	Avg Quarterly Return Low Growth	Correlation with MSCI World	Corr w MSCI World in Low Growth	Sample
Real Estate						
NCREIF ODCE Core*	0.65%	0.84%	0.12%	0.13	0.27	3/78 - 12/09
CalPERS Total – Real Estate**	1.37%	1.99%	-1.04%	0.13	0.37	12/82 - 9/09
CalPERS Core – Real Estate**	1.40%	1.73%	0.11%	0.03	0.27	12/82 - 9/09
CalPERS AIM Composite**	1.86%	2.91%	-2.30%	0.59	0.57	3/91 - 9/09

*National Council of Real Estate Investment Fiduciaries Open End Diversified Core Equity Index

** Series have been rolled back 3 months to better coincide with other measures

Fixed Income Returns and Correlation Under Growth Regimes

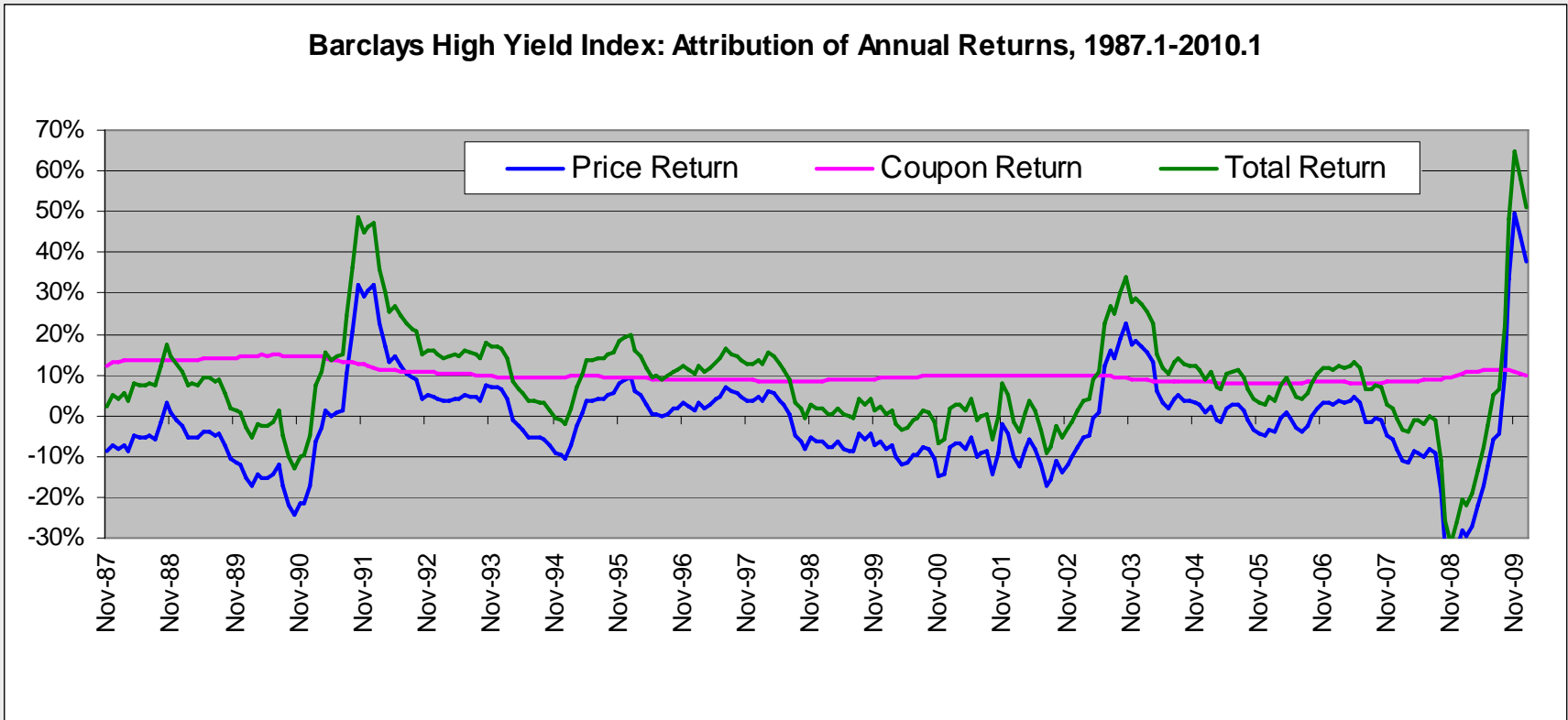
Summary Real Return Properties for Selected Monthly Fixed Income Series July 1988 - December 2009

	<u>Average Monthly Real Returns</u>			<u>Correlation with MSCI World</u>	
	<u>Total Sample</u>	<u>High Growth</u>	<u>Low Growth</u>	<u>Overall</u>	<u>Low Growth Periods</u>
CalPERS GFI	0.45%	0.45%	0.47%	0.26	0.49
CalPERS GFI Benchmark	0.41%	0.35%	0.57%	0.14	0.38
Barclays Government Aggregate	0.34%	0.22%	0.65%	-0.05	0.13
Barclays Inv Grade Aggregate	0.39%	0.40%	0.36%	0.29	0.46
Barclays High Yield*	0.46%	0.82%	-0.51%	0.58	0.62
Barclays Credit - Mortgages	0.37%	0.31%	0.54%	0.20	0.38
Barclays & Synthetic 10yr TIPS**	0.43%	0.28%	0.84%	0.16	0.44

*Refer to Appendix d

**TIPS series prior to 1997 simulated using nominal 10 yr yields and estimated inflation expectations

Barclays High Yield Index: Attribution of Monthly Returns (1987.1-2010.1)



CalPERS Liability Proxy

- **CalPERS liabilities consist of forecast benefit payments to retirees and current active members**
- **Inflation protection is greater for active members because of the positive relation between salary growth and inflation**
- **Aggregate inflation protection is 73%**
 - a 1% rise in inflation will cause undiscounted nominal payments to rise by 0.73%
- **This indicates that TIPS (U.S. Treasury inflation linked securities) represent 73% of the liability proxy index**
 - Like this portion of liabilities, TIPS have a fixed yield plus an adjustable yield that varies with realized inflation
- **The 27% that is non-inflation protected is represented by Treasuries**
 - representing forecast benefit payments that are independent of inflation

	Percentage of Liabilities	Inflation Protection	Product
Active Members	53.0%	86.0%	45.6%
Retirees	47.0%	59.0%	27.7%
Sum	100%		73.3%
			↓
Resulting Liability Proxy		TIPS	73%
		Treasuries	27%
		Total	100%

Review of Asset Class Roles

Currently CalPERS uses five broad asset classes in the strategic asset allocation policy. Recent experience has shown that these traditional asset class labels tend to mask the underlying risk exposures. Measures of standard deviation and correlation do not provide a full picture of the fundamental risk exposures of assets and their return drivers. The volatility of recent portfolio returns indicates that the diversification was not adequate to moderate the impact of high volatility and unstable correlations. All assets except government bonds were highly correlated to equities. CalPERS portfolio did not have meaningful exposure to assets that could have been a hedge in times of financial crisis and provide adequate liquidity to the fund. The volatility of the total fund and asset class correlations is shown in slides 3 and 4 of Attachment 1. The underlying drivers of asset returns are fundamental in nature. Hence, staff believes that it is important to identify the common fundamental risk factors and return drivers of various assets across the portfolio and to classify them accordingly as a first step in the ALM process.

Drivers of Asset Returns

This review of fundamental economic factors and return drivers will enable an improved understanding of how the portfolio performs across a range of economic environments. This understanding underpins the asset reclassification presented in this item and will also be valuable later in generating diversified policy portfolios. Three important factors and return drivers are listed in Table 1 below:

Table 1. Investment Return Drivers

<i>Factor</i>	<i>Return Drivers</i>	<i>Relation with Asset Return</i>
Economic Growth	Earnings growth Dividends Demand for commodities	Positive for all assets except government nominal and inflation-linked bonds
Inflation	Higher discount rates Lower asset value	Negative for all assets except commodities and inflation-linked bonds
Real yield	Value of fixed coupons decrease	Negative for bonds; mixed for growth assets

Returns Conditional on Economic Growth and Inflation

The analysis of asset returns under expanding and contracting economic regimes presented on slide 8 shows that performance of many of the assets represented across the CalPERS' portfolio are significantly related to economic growth. The actual returns of the CalPERS AIM and Real Estate portfolios under these economic scenarios shown on slide 9 also indicate high growth bias. For public equities, the AIM program, high yield bonds and some measures of real estate, real return performance for the available series is, on average, positive if leading economic indicators are improving and negative if deteriorating. Nominal government bonds and government inflation-linked bonds—treasury inflation protected securities (TIPS) are the only asset classes that are relatively insensitive to the economic cycle.

As presented on slide 10, most asset classes experience negative real returns in the presence of high inflation. Inflation-linked bonds and commodities are the only asset classes to deliver positive returns under high inflation.

Liabilities

Investments also vary in their similarity to CalPERS liabilities. CalPERS liabilities consist of forecast benefit payments over decades that depend substantially on realized inflation.

The accreted value of TIPS is similarly adjusted to capture realized inflation. This linkage to realized inflation makes TIPS, particularly long-maturity TIPS, the asset most similar to CalPERS liabilities, thus the asset that best hedges the liabilities (CEM, August 2009, Chapter 5). The values of TIPS and CalPERS liabilities are both little affected by changes in inflation, but are strongly negatively related to changes in real yields.

Other assets that partially hedge liabilities over short periods are Treasuries followed by other nominal bonds.

Alternative Asset Classification

The alternative asset classification listed in Table 2 below is intended to effectively address the limitations of the current asset categorization. This classification places various assets in the CalPERS portfolio into six different categories based on their return drivers and fundamental characteristics.

Table 2. Alternative Asset Classification

<u>Asset Classification</u>	<u>Building Blocks</u>	<u>Primary Objectives</u>	<u>Return Driver</u>
Government bonds	1. Govt. nominal bonds 2. Govt. inflation-linked bonds	Diversify growth assets Hedge Liabilities Provide liquidity	Yield changes
Income	3. Investment grade spread sector bonds (corporate bonds, mortgages, other asset-backed securities), securities lending, credit enhancement	Outperform government bonds Some diversification and liability hedging Income-driven returns	Yield
Growth	4. Public equity 5. Private equity (AIM) 6. Real estate 7. High yield bonds	Achieve high returns from economic growth, subject to prudent risk	Economic Expansion
Inflation-Linked	8. Infrastructure, forestland 9. Commodities	Hedge inflation risk Hedge risk of commodity price spikes	Change in Inflation
Market Neutral	10. Absolute Return: Hedge funds & all strategies with low asset class beta	Materially outperform cash Generate stable returns	Manager Decisions
Liquidity	11. Short-term high-quality fixed income securities	Provide liquidity	Central Bank Rates

In the above classification, real estate is classified under growth, but could be under income if the strategy is mainly to generate income returns. Inflation-linked bonds could alternatively be classified under the inflation linked category.

Advantages of the Alternative Classification

1. Considers fundamental factors that influence returns and risk and hence transcends the limitations of the more statistics based approach currently used.
2. Provides a way for more effective risk diversification under varying economic scenarios, reduces growth factor risk.
3. Provides a way for increased focus on liability hedging, liquidity and income returns than currently exist.
4. Could be a platform for more dynamic implementation of the strategic allocation within risk limits.
5. Establishes a separate asset class for absolute return strategies in recognition of their distinct return profile.

Disadvantages of the Alternative Classification

1. Target allocations for government bonds and inflation-linked bonds would tend to reduce expected returns. This could be mitigated by increased allocations to absolute return strategies and overlays or by increasing fixed income through leverage.
2. Policy allocation becomes more granular and the optimization process slightly more complex with a larger number of assets.

Implementation

The implementation of the proposed asset classification is not expected to impact the existing organization structure within the Investment Office. Two asset classes would be impacted in the way the portfolios are structured:

Fixed Income

Fixed income would have targets and benchmarks for multiple portfolios (government bonds, inflation-linked bonds, spread products) and the policies would have to be amended accordingly.

Real Estate

If classified under growth, there would be no changes to the current strategies and benchmarks. If classified under income, there would have to be changes to the Real Estate strategy, benchmark and policy.

V. STRATEGIC PLAN:

This item addresses Strategic Plan Goals VIII, manage the risk and volatility of assets and liabilities to ensure sufficient funds are available, first, to pay benefits and second, to minimize and stabilize contributions; and IX, achieve long-term, sustainable, risk adjusted returns.

VI. RESULTS/COSTS:

This item is for information only.

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Managing Director*

*Michael C. Schlachter, CFA
Managing Director*

March 1, 2010

Dr. George Diehr
Chairman, Investment Committee
California Public Employees' Retirement System
400 Q Street
Sacramento, CA 95814

Re: Roles of Asset Classes in Strategic Asset Allocation

Dear Dr. Diehr:

Wilshire has participated in a Staff/Consultant group effort working to define the roles of asset classes for the upcoming Asset Allocation workshop. The focus has been to clarify the rationale for investing in a variety of asset classes and consider the performance of the various asset classes during a range of economic environments. Currently, CalPERS' portfolio is strategically positioned to participate in economic growth. However, as demonstrated by the returns during 2008 and 2009, performance during other economic periods may be difficult and the effects of diversification less than estimated.

Based on these meetings we believe there remain a few issues of disagreement between Staff and Wilshire. We request that the Investment Committee provide guidance on the following issues.

1. The role of real estate

Wilshire has proposed bifurcating real estate into two components, based on our view of the rationales for investing in each. We believe that core real estate is an asset class with returns driven primarily by the income of the properties and overall economic growth is not a prerequisite for success (economic stability is necessary, but not growth). Value added and opportunistic real estate returns are driven by repurposing, retenanting, redeveloping or developing properties and, while income may be a component of returns, economic growth is a prerequisite for success.

As such, Wilshire recommends that core real estate be classified as "Income" and value added and opportunistic real estate be classified as "Growth."

2. The role of high yield bonds

Similarly, we believe that the returns of high yield bonds are driven primarily by the coupon payments. While we recognize that the correlation between high yield and equities is high and that poor corporate health can negatively affect returns in both asset classes, the upside participation of high yield bonds in a growing economy is capped by the par amount of the bond.

As such, Wilshire recommends that high yield bonds be categorized as “Income.”

Conclusion

While these disagreements are not colossal and should not be viewed as a vote of dissent on the overall process, the Investment Committee should clarify their expectations for the role of these specific asset classes. The results are not likely to cause significant deviation on the results of the Asset Allocation workshop, but the outcome may be affected. Wilshire believes that the Investment Committee’s strategic intent with respect to asset classes should be a consideration during the asset allocation process.

Best regards,

A handwritten signature in black ink, appearing to read "Alan Jinn". The signature is fluid and cursive, with a large initial "A" and "J".A handwritten signature in black ink, appearing to read "Michael J. Wilshire". The signature is more formal and blocky than the one above, with a long horizontal stroke at the end.

March 2, 2010

Dr. George Diehr
Chairman, Investment Committee
California Public Employees' Retirement System
400 Q Street
Sacramento, CA 95814

Re: Recommended Revision of Strategic Portfolio Classifications

Dear Dr. Diehr:

With regard to the staff's recommendations presented at the workshop on the role of asset classes, PCA's opinion concerning the process and the recommendations follow. The memorandum written by staff is representative of the process and consensus recommendations of the working group. The recommended revisions to the strategic portfolio classifications are a large step in reclassifying the portfolio along lines of risk, and away from less meaningful asset labels. PCA believes that institutional investors are beginning to refine their risk management practices and these recommendations reflect that change. Therefore, in our opinion, the revised strategic classifications should provide a better understanding of portfolio risks and performance drivers to the board and staff, and we concur with these recommendations.

However, while the recommendations do provide for a framework that is more aligned along portfolio risk lines, they do not necessarily introduce significant new flexibility. If a goal of the board is to increase implementation flexibility within a revised strategic classification framework, we believe you should consider relaxing the assignment of assets to specific asset "building blocks." Please refer to Table 3 of the staff memo for the proposed assignments. While such a step admittedly introduces additional complexity that may require a phased introduction, it is becoming evident that more flexible risk-based strategies are worth serious consideration and study. In fact, several leading global investment funds have already adopted such a framework.

For instance, as noted in the staff memorandum, real estate assets could be classified growth, income, or inflation linked, depending on the risk attributes of specific property holdings and their lease contract provisions. Similarly, Treasury Inflation Protected Securities (TIPS) could be classified under government bonds or inflation linked. Finally, the market neutral classification is not an asset at all, but a set of long and short positions that change constantly under active management.

We believe it is important that the board recognize a reclassification along risk lines blurs asset boundaries, but that this is a necessary evolution towards a more effective portfolio construction and risk management framework.

Regards,
PCA