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Risk-Based Asset Allocation:

The Devil is in the Details

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We believe

Risk buckets are more important than *asset classes* for portfolio construction purposes, since there is often *high* correlation *across* asset classes (“in a crisis all correlations go to 1”) and *low* correlation *within* asset classes (e.g. dispersion within fixed income during the recent crisis).

The key buckets are: *growth* assets, *inflation* hedges, and *deflation* hedges. However, three buckets may be too simplistic and more nuance is needed.

Macroeconomic factors have an impact on assets. Prices are determined by expectations about those factors.

Historically, asset performance varies significantly across the economic regimes.

The length of economic regimes matters in the context of portfolio construction. The transitions among regimes have not followed the conventional cycle of cooling/warming.

Source: Investment Strategy & Solutions Group

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The March Towards Risk-Based Asset Allocation



From Stage I to Stage II: During the multi-decade bull market that started in 1983, investors largely abandoned cash as a “drag on performance” and embraced alternative assets in the search for attractive absolute return with low correlation to stocks and bonds.

From Stage II to III: During the recent financial crisis, “all correlations went to 1.” Many investments in the bond and alternatives category fell along with stocks. Investors are now focused on “risk-based asset allocation.”

Source: Investment Strategy & Solutions Group

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We see asset classes and risk buckets used in tandem

A typical risk-based asset allocation scheme recognizes high correlations across the traditional asset classes and focuses on maintaining a diverse set of risk exposures.

	Growth	Inflation	Deflation
Traditional Asset Classes	Equity		Utilities Equity
	U.S. Equity	Energy Equity	
	Int'l Equity		
	EM Equity		
Fixed Income		TIPS	Treasuries
	High Yield		Sovereign Debt
			High Quality Corp.
Alternatives	Private Equity	Real Estate	Specialty HF
	Long-biased HF	Commodities	Interest Rate Products
		Real Assets	

Source: Investment Strategy & Solutions Group

A further refinement of the bucketing system

"Goldilocks economics" is too simplistic



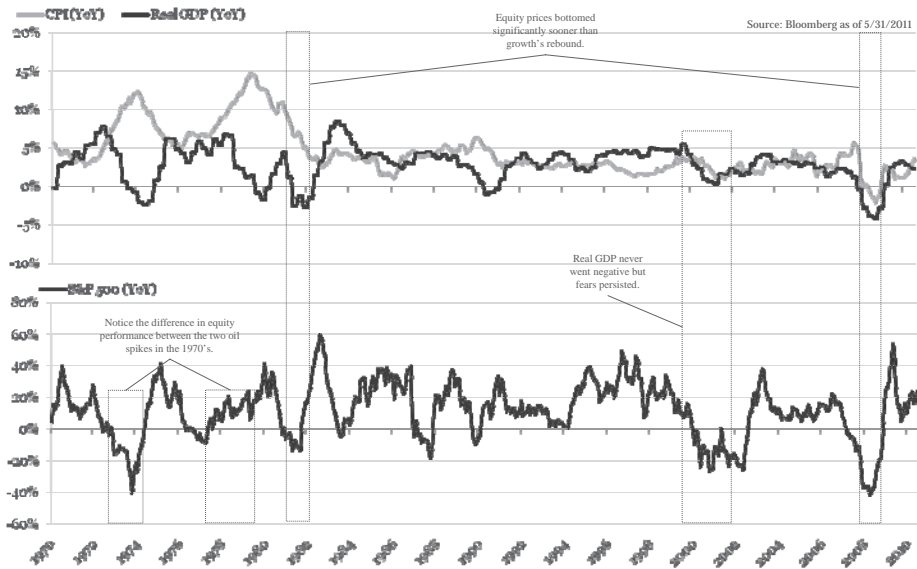
We believe the interaction of the two variables, growth (measured by real GDP) and inflation (measured by CPI) creates a minimum of four scenarios. However, five scenarios are described below (Too Cold is a special case of Cooling where real GDP is sharply declining).



	Just Right (Growth)			Inflation	Deflation
	Perfection	Warming	Cooling	Too Hot	Too Cold
Growth	Increasing	Increasing	Decreasing	Decreasing	Sharply Decreasing
Inflation	Decreasing	Increasing	Decreasing	Increasing	Decreasing

Source: Investment Strategy & Solutions Group

Our analysis shows changes in growth and inflation don't explain everything



Please see appendix for index descriptions. Source: Ibbotson, Bloomberg as of 5/31/2011

We believe revisions to expectations matter

Current prices reflect an expected inflation rate, an expected real growth rate of the economy, and expected risk premium specific to each asset.

$$P_0 = f(E[i_0], E[g_0], E[rp_0], \dots)$$

So, changes in asset prices are a function of changes in expected inflation, real growth, and risk premiums.

$$\frac{P_1}{P_0} = f(\underbrace{E[i_1] - E[i_0], E[g_1] - E[g_0], E[rp_1] - E[rp_0], \dots}_{\text{Revisions to Expectations}})$$

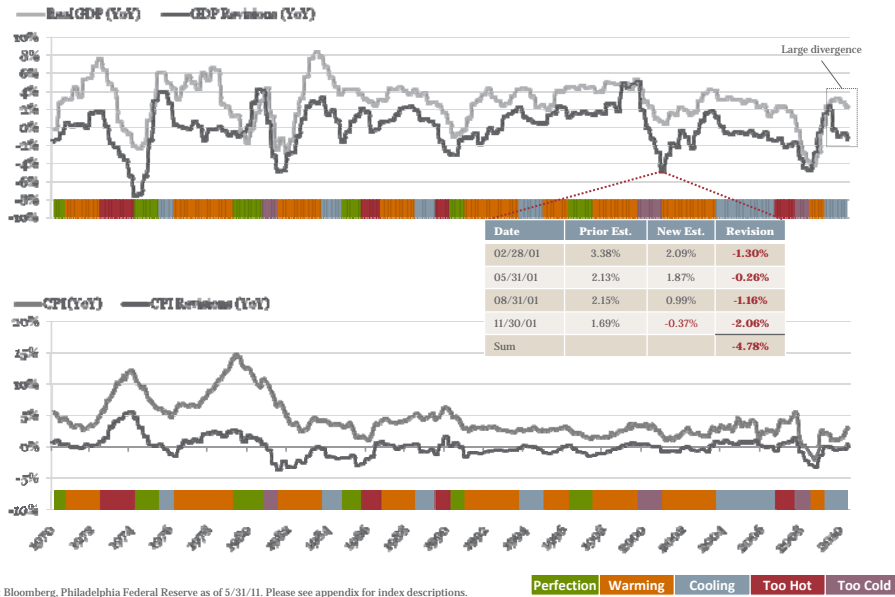
Revisions to Expectations

We believe defining macroeconomic regimes based on revisions to inflation and real growth expectations produces more intuitive and differentiated asset class return patterns than those based on reported levels of inflation and real growth.

We use data from the Survey of Professional Forecasters as a measure of how expectations for real growth and inflation were revised over time.

Source: Investment Strategy & Solutions Group

Revisions to expectations vs. changes in levels

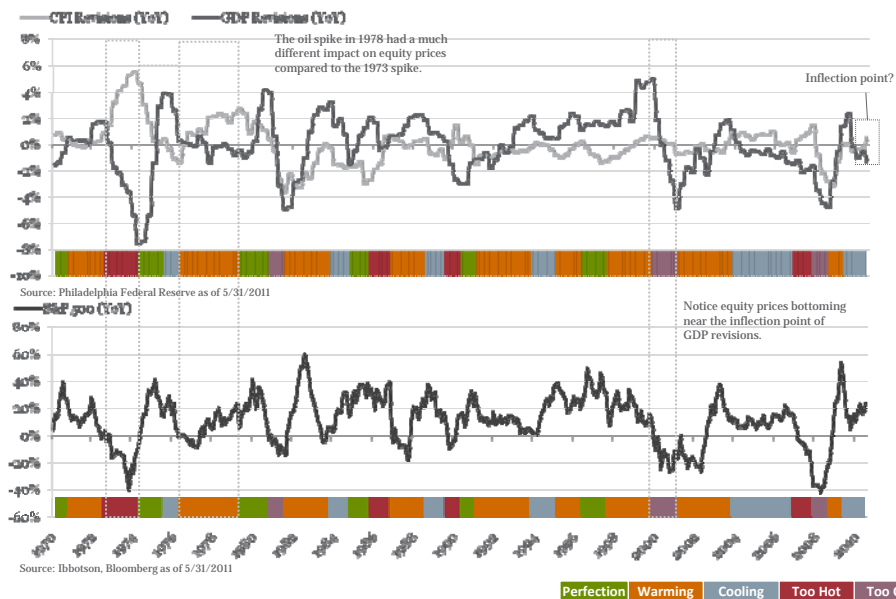


Source: Bloomberg, Philadelphia Federal Reserve as of 5/31/11. Please see appendix for index descriptions.

Perfection Warming Cooling Too Hot Too Cold

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Equity prices turn with revisions to expectations



Please see appendix for index descriptions.

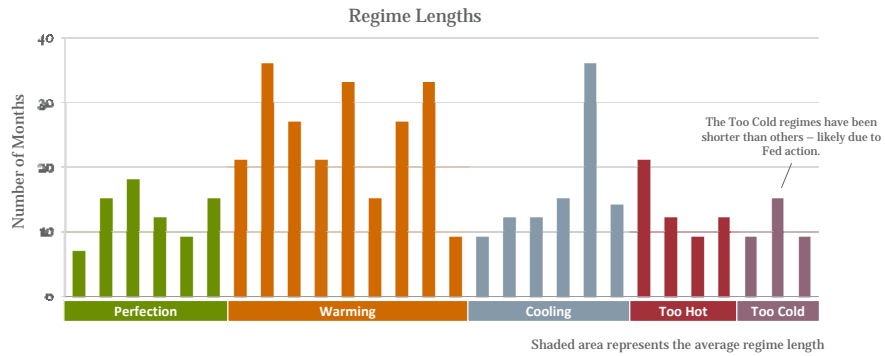
Perfection Warming Cooling Too Hot Too Cold

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We believe regime dynamics should impact investment decisions

Regime lengths vary through time and investors need to be aware that they can occasionally last significantly longer than the historical average.

Investors should be concerned about the current regime, how long it will last, and which regime(s) could be next.

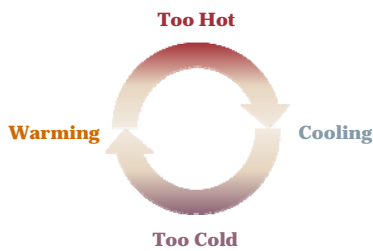


Source: Investment Strategy & Solutions Group

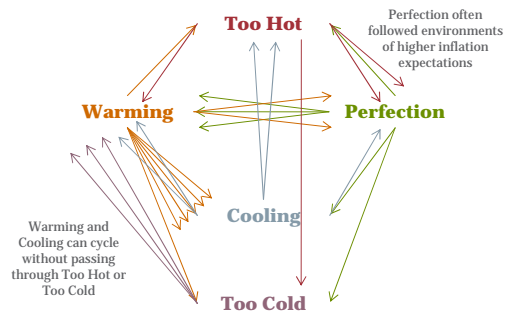
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The cycle of regimes

The conventional image



The actual transitions over the last 40 years



Source: Investment Strategy & Solutions Group

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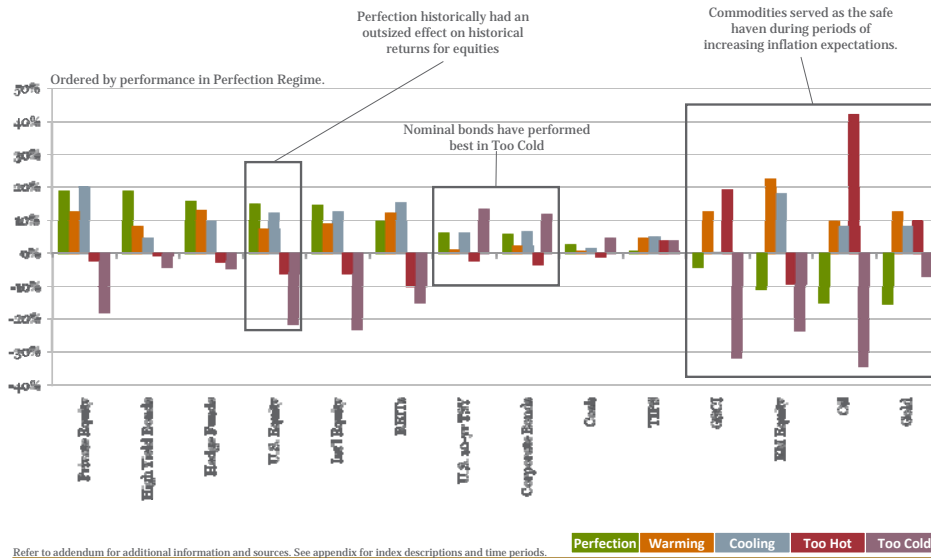
We believe equity performance is regime dependent

Regime	Inflation	Growth	Frequency	Real Return	Contribution to Return
Too Hot	Rising	Falling	11%	-5.9%	-0.7%
Too Cold	Falling	Negative	7%	-21.6%	-1.5%
Cooling	Falling	Falling	20%	12.0%	2.4%
Warming	Steady/Rising	Steady/Rising	46%	7.5%	3.4%
Perfection	Falling	Rising	16%	14.6%	2.3%
Total			100%	6.0%	6.0%

Source: Ibbotson, Bloomberg. As of 5/31/2011. Returns calculated using the regimes outlined on slide 10. Please see appendix for index descriptions.

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We believe asset performance is regime dependent



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A sample multi-dimensional framework

	Growth			Inflation	Deflation
	Perfection	Warming	Cooling	Too Hot	Too Cold
Equity	Equities (especially consumer-related and tech), U.S., Int'l and EM	Nat. Resource Equity EM Equity Energy Stocks Industrial Stocks	EM Equity Energy Stocks Utilities Stocks	Nat. Resource Equity Energy Stocks	Utilities and Healthcare Equities
Fixed Income	High Yield Bonds Corporate Bonds	Inflation-Linked Bonds High Yield Bonds	Treasuries Global Bonds Corporate Bonds	Inflation-Linked Bonds Global Linkers	Treasuries Global Bonds Ultra High Quality Corp. Cash
Alternatives	Private Equity Long-biased HF Real Estate	Real Estate Commodities Infrastructure Real Assets Private Equity Gold	Real Estate Private Equity	Commodities Oil Gold	Specialty Hedge Funds "Interest Rate Products"

The chart above identifies which asset classes ISSG believes are likely to outperform in the various economic regimes.

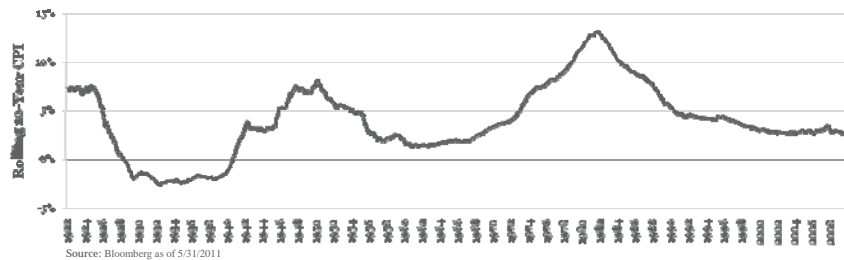
Warning: more detail is likely to create more devils. Valuation needs consideration.

Source: Investment Strategy & Solutions Group

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Inflation's impact on assets, spending, and liabilities

Inflation has been more common than deflation in the U.S. since the creation of the Federal Reserve



Degree of inflation exposure

	Less	Corporate DB Plans	Public DB Plans	Endowments & Foundations	More
Spending		Typically no COLA's*, but open plans have some inflation sensitivity.	COLA's create higher inflation sensitivity.	Recipient programs have a high degree of inflation sensitivity.	
Liabilities		Discount rate is market-based, so deflation (tends to boost liabilities while reducing asset values) is generally a bigger risk than inflation (which tends to reduce liabilities).	Discount rate based on expected return of assets, which softens the impact of changing interest rate environment.	No need to calculate liabilities.	

Source: Investment Strategy & Solutions Group *Cost of Living Adjustments

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Addendum: Asset return consistency by regime

	Private Equity ²	High Yield Bonds ¹	Hedge Funds ³	U.S. Equity ¹	Int'l Equity ¹	REITs ⁴	U.S. 10-yr Treasury ⁵	Corporate Bonds ¹	Cash ¹	TIPS ⁵	GSCI ¹	EM Equity ¹	Oil ¹	Gold ¹
Perfection	18.8%	18.5%	15.6%	14.6%	14.4%	9.9%	6.0%	5.6%	2.5%	0.9%	-4.0%	-10.6%	-14.9%	-15.1%
1				4.9%	26.2%		-0.6%						-4.2%	17.5%
2				15.7%	-4.0%	9.9%	-0.8%	3.5%	-0.4%	-4.0%	6.8%		1.1%	-30.0%
3				-0.3%	0.0%	1.3%	-7.5%	-6.6%	2.1%	-3.6%	-16.0%			-13.1%
4	3.8%	18.9%		36.7%	100.5%	22.3%	33.3%	20.1%	5.2%	8.7%	12.9%			-44.3%
5	6.3%	34.8%	22.7%	3.2%	-11.2%	13.1%	11.4%	12.2%	2.7%	4.7%	10.2%	18.2%	13.1%	-3.3%
6	32.8%	9.5%	11.6%	29.5%	13.7%	9.3%	10.9%	8.8%	3.6%	3.2%	-18.2%	-24.4%	-21.9%	-17.6%
Warming	12.2%	8.0%	12.9%	7.5%	8.9%	12.0%	1.1%	2.4%	0.9%	4.5%	12.5%	22.6%	9.6%	12.2%
1				2.1%	24.7%	-5.8%	-0.6%	-6.0%	-0.2%	4.5%	90.3%		-4.1%	77.6%
2				-0.1%	9.4%	11.8%	-11.4%	-11.8%	-1.8%	1.3%	15.4%			27.0%
3				20.4%	10.8%	22.0%	10.5%	13.4%	5.4%	4.8%	3.4%			-11.3%
4	3.4%	5.0%		-2.5%	0.1%	-0.2%	6.0%	6.0%	2.4%	8.6%	17.8%	54.1%	-3.9%	-15.8%
5	13.2%	9.2%	18.5%	9.0%	9.5%	13.8%	4.1%	4.7%	0.6%	3.6%	-6.4%	32.0%	-9.7%	-0.9%
6	22.6%	9.8%	18.8%	22.7%	3.6%	29.8%	-1.5%	1.3%	2.1%	0.7%	23.6%	14.7%	5.9%	-7.5%
7	19.2%	-2.4%	13.7%	14.2%	7.0%	-3.9%	2.3%	0.9%	2.3%	4.8%	17.1%	5.7%	37.7%	-4.5%
8	5.1%	10.1%	4.9%	-1.8%	4.4%	17.6%	3.7%	5.1%	-1.1%	7.7%	21.8%	16.1%	29.3%	13.1%
9	20.5%	35.9%	11.1%	28.2%	18.9%	54.1%	0.0%	18.1%	-1.7%	4.0%	3.7%	29.3%	25.4%	17.4%
Cooling	20.1%	4.6%	9.8%	12.0%	12.3%	15.3%	6.3%	6.5%	1.7%	4.8%	0.2%	17.9%	8.1%	8.1%
1				-2.5%	1.7%	37.8%	6.2%	9.0%	-1.0%	2.1%	-27.5%		12.4%	13.2%
2				14.8%	28.0%	27.2%	25.2%	23.3%	5.2%	14.1%	-7.8%		-7.0%	-7.6%
3	4.6%	-7.6%	20.6%	11.7%	-1.6%	-7.4%	4.0%	4.4%	3.7%	6.3%	14.2%	20.8%	-16.2%	-3.9%
4	20.9%	10.1%	11.7%	21.6%	-0.2%	3.2%	13.6%	11.8%	3.1%	7.9%	4.3%	-19.5%	0.3%	-2.5%
5	25.8%	4.0%	8.5%	8.7%	18.9%	13.7%	0.3%	0.1%	0.7%	0.6%	1.7%	34.8%	17.0%	14.4%
6	18.7%	12.1%	8.3%	18.3%	17.3%	33.1%	2.0%	4.8%	-1.2%	5.8%	13.2%	23.2%	31.7%	28.6%
Too Hot	-2.1%	-0.4%	-2.4%	-5.9%	-6.1%	-9.9%	-2.0%	-3.3%	-1.0%	4.0%	19.2%	-9.2%	42.2%	10.0%
1				-18.5%	-18.7%	-17.5%	-4.9%	-8.0%	-2.5%	6.5%	9.3%		73.4%	11.7%
2	1.5%	5.0%		29.0%	40.0%	2.2%	-10.0%	-1.3%	1.3%	-1.9%	20.8%		19.0%	11.6%
3	-0.9%	0.4%	3.2%	0.1%	-6.8%	-3.9%	8.2%	5.8%	1.6%	1.7%	21.5%	-1.6%	7.5%	-3.9%
4	-6.4%	-6.1%	-6.4%	-15.7%	-18.3%	-11.8%	4.5%	-3.3%	-2.5%	7.3%	34.7%	-14.4%	48.0%	16.7%
Too Cold	-18.0%	-4.1%	-4.4%	-21.6%	-22.9%	-14.9%	13.1%	11.5%	4.5%	3.8%	-31.4%	-23.2%	-34.2%	-6.6%
1				-10.7%	-12.6%	-4.0%	23.0%	22.0%	8.1%	0.2%	-1.4%		-8.1%	-35.5%
2	-16.5%	-2.5%	-3.4%	-21.2%	-24.2%	12.6%	9.2%	9.6%	2.6%	7.6%	-23.9%	-25.1%	-36.1%	-3.7%
3	-20.5%	-6.6%	-6.0%	-31.9%	-30.0%	-52.7%	10.4%	4.8%	3.9%	1.5%	-59.9%	-20.1%	-50.7%	28.4%

U.S. Equity has fairly consistently had positive real returns through each Perfection regime.

Non-U.S. equities have fared well through all historical Warming regimes

Nominal, flight-to-quality assets have been the safe haven.

Source: Bloomberg¹, Cambridge Associates², HFR³, Federal Reserve Bank of St. Louis 'as of 5/31/11. TIPS⁵ return data simulated prior to 1997. See appendix for index descriptions and return time periods.

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Appendix

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Sources

Asset Class Name	Index	Start	End
US Equity/US Real Stock Return	S&P 500	12/31/1969	05/31/2011
International Equity	MSCI EAFE	12/31/1970	05/31/2011
Emerging Market Equity	MSCI EM	12/31/1987	05/31/2011
10-Year Treasury	St. Louis Fed	12/31/1969	05/31/2011
High Yield Bonds	CSFB High Yield Index	12/31/1985	05/31/2011
Corporate Bonds	Barclays Capital US IG Corporate Bond	01/31/1973	05/31/2011
TIPS	Barclays US Government Inflation Linked Bond	03/31/1997	05/31/2011
TIPS 2	ISSG TIPS Simulation	01/31/1972	03/31/1997
Private Equity	Cambridge Associates Private Equity returns	01/31/1996	12/31/2010
Hedge Funds	HFR fund weighted composite	01/31/1990	05/31/2011
GSCI	S&P GSCI	01/31/1973	05/31/2011
CPI	CPI Urban Consumers (seasonally adjusted)	12/31/1969	05/31/2011
Oil	NYMEX Crude Futures/Spot Oil	12/31/1969	05/31/2011
Gold	COMEX Gold/Spot Gold	12/31/1969	05/31/2011
GDP	US GDP (seasonally adjusted)	12/31/1969	05/31/2011
Real Estate (Listed)	FTSE EPRA/NAREIT U.S. Real Estate Equity Index Series	12/31/1989	05/31/2011
GDP Revisions	Survey of Professional Forecasters/Federal Reserve Bank of Philadelphia	12/31/1969	05/31/2011
CPI Revisions	Survey of Professional Forecasters/Federal Reserve Bank of Philadelphia	12/31/1969	05/31/2011

- The Survey of Professional Forecasters is the oldest quarterly survey of macroeconomic forecasts in the United States. The survey began in 1968 and was conducted by the American Statistical Association and the National Bureau of Economic Research. The Federal Reserve Bank of Philadelphia took over the survey in 1990. The forecasted annual CPI inflation and GDP growth are an aggregation of the forecasted values for each of the next four quarters.

- The MSCI EAFE index is widely accepted as a benchmark for international stock performance (excluding the United States and Canada), and measures the performance of the developed stock markets of Europe, Australia, and the Far East (EAFE). The index is an aggregate of 22 individual country indexes that collectively represent many of the major markets of the world. The index series includes only markets, companies, and share classes available to foreign investors. It is designed to maximize float and liquidity, minimize cross-ownership, and accurately reflect the market's total size, industry composition, and size of stock. The index is calculated on a total return with the percentage change in price plus actual coupon income making up the total return. The index is rebalanced monthly.

- S&P 500 Index is considered to be generally representative of the U.S. large capitalization stock market as a whole. It is an unmanaged capitalization-weighted index of 500 commonly traded stocks designed to measure performance of the broad domestic economy through changes in the aggregate market value of those stocks. The index assumes reinvestment of dividends.

- The CSFB High Yield Index, compiled by Credit Suisse First Boston, measures high-yield debt securities, which are often referred to as "junk bonds."

- MSCI Emerging Markets Index (EM) is a capitalization-weighted benchmark designed to measure global emerging equity market performance and is calculated on a total return basis with dividends reinvested.

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Appendix

- CPI Urban Consumers (seasonally adjusted) –All Urban program produces monthly data on changes in the prices paid by urban consumers for a representative basket of goods and services.
- HFRI Fund of Funds Composite Index is an equally weighted performance index of fund of hedge funds selected by HFR. The index includes both onshore and offshore fund of funds, which invest across the spectrum of hedge fund strategies. There are no minimum asset sizes or operating history constraints. All underlying funds report returns net of fees and in US dollars. HFR, as a business practice, does not reveal of the names of participant funds.
- The FTSE EPRA/NAREIT U.S. Real Estate Equity Index Series is designed to provide the most comprehensive assessment of overall industry performance, and includes all tax-qualified real estate investment trusts (REITs) that are listed on the New York Stock Exchange, the American Stock Exchange and the NASDAQ National Market List. The index constituents span the commercial real estate space across the US economy and provide investors with exposure to all investment and property sectors.
- Cambridge Associates Private Equity Returns- Please refer to the Proprietary Benchmarks page of the Cambridge Associates website at www.cambridgeassociates.com for additional information.
- The Barclays US Government Inflation-Linked Bond Index measures the performance of the US Treasury Inflation Protected Securities ("TIPS") market. The index includes TIPS with one or more years remaining maturity with total outstanding issue size of \$500m or more.
- TIPS returns prior to 1997 were simulated by the ISSG using breakeven inflation rates from the United Kingdom, Ten-Year Treasury Yields, and Survey of Professional Forecasters data from the Federal Reserve Bank of Philadelphia.
- The Barclays Capital U.S. IG Corporate Bond Index is a broad-based benchmark that measures the investment grade, fixed-rate, taxable, corporate bond market. It includes USD-denominated securities publicly issued by U.S. and non-U.S. industrial, utility, and financial issuers that meet specified maturity, liquidity, and quality requirements. Securities in the index roll up to the U.S. Credit and U.S. Aggregate Indices. The index was launched on January 1, 1973.
- NYMEX Oil is an index blend of several U.S. domestic streams of light sweet crude oil with physical delivery.
- COMEX Gold is an index of 100 troy ounces of gold with physical delivery.
- The Federal Reserve Bank of St. Louis is one of the 12 regional reserve banks in the Fed System.
- S&P GSCI index is a composite index of commodity sector returns representing an unleveraged, long-only investment in commodity futures that is broadly diversified across the spectrum of commodities. The returns are calculated on a fully collateralized basis with full reinvestment.
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