

Arizona State Retirement System

Independent ASRS Investment Program Oversight

April 20, 2015

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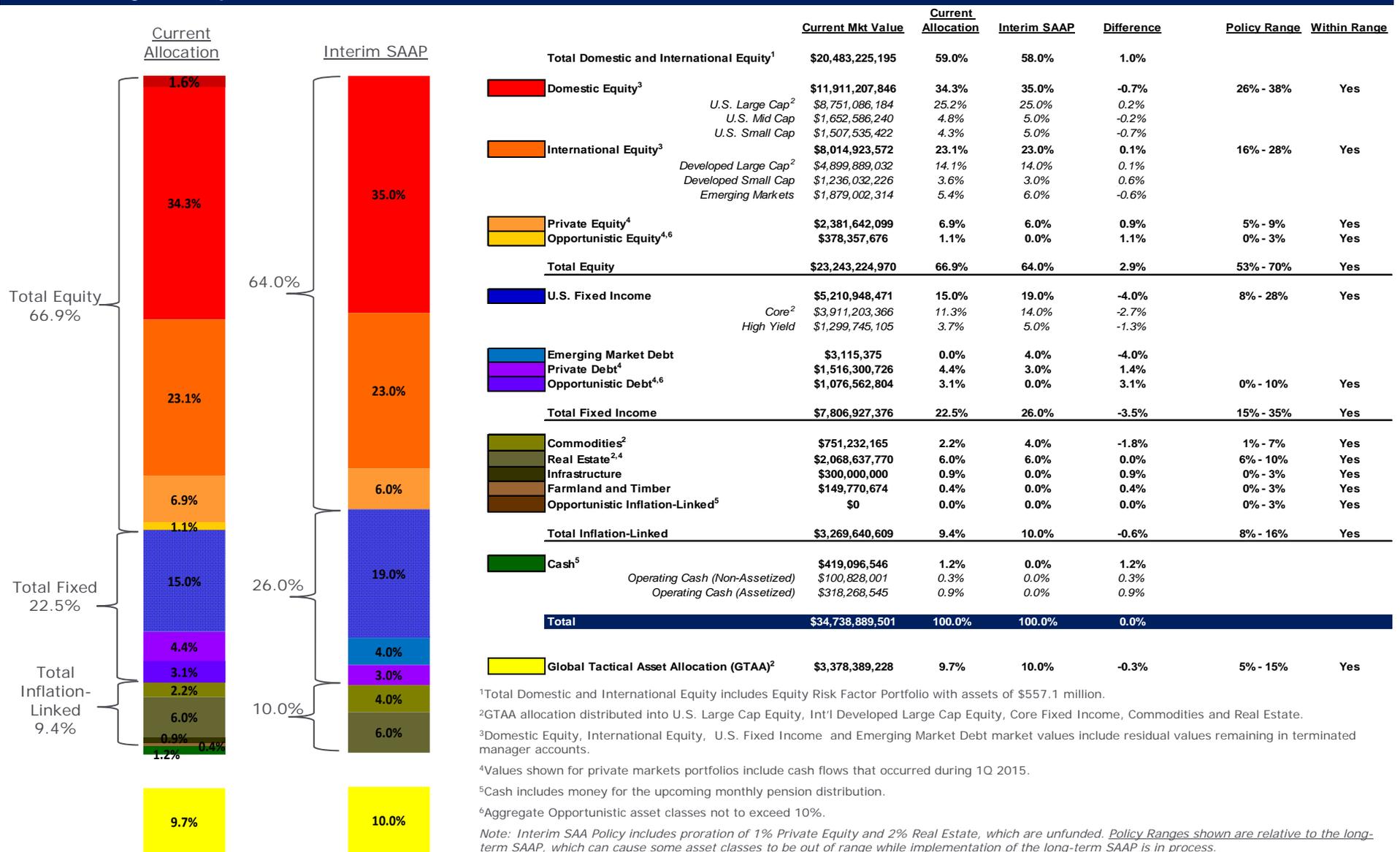
- Independent Oversight/Compliance
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Independent Oversight/Compliance



Arizona State Retirement System

SAA Policy Compliance



	Current Mkt Value	Current Allocation	Interim SAAP	Difference	Policy Range	Within Range
Total Domestic and International Equity¹	\$20,483,225,195	59.0%	58.0%	1.0%		
Domestic Equity³	\$11,911,207,846	34.3%	35.0%	-0.7%	26% - 38%	Yes
U.S. Large Cap ²	\$8,751,086,184	25.2%	25.0%	0.2%		
U.S. Mid Cap	\$1,652,586,240	4.8%	5.0%	-0.2%		
U.S. Small Cap	\$1,507,535,422	4.3%	5.0%	-0.7%		
International Equity³	\$8,014,923,572	23.1%	23.0%	0.1%	16% - 28%	Yes
Developed Large Cap ²	\$4,899,889,032	14.1%	14.0%	0.1%		
Developed Small Cap	\$1,236,032,226	3.6%	3.0%	0.6%		
Emerging Markets	\$1,879,002,314	5.4%	6.0%	-0.6%		
Private Equity⁴	\$2,381,642,099	6.9%	6.0%	0.9%	5% - 9%	Yes
Opportunistic Equity^{4,6}	\$378,357,676	1.1%	0.0%	1.1%	0% - 3%	Yes
Total Equity	\$23,243,224,970	66.9%	64.0%	2.9%	53% - 70%	Yes
U.S. Fixed Income	\$5,210,948,471	15.0%	19.0%	-4.0%	8% - 28%	Yes
Core ²	\$3,911,203,366	11.3%	14.0%	-2.7%		
High Yield	\$1,299,745,105	3.7%	5.0%	-1.3%		
Emerging Market Debt	\$3,115,375	0.0%	4.0%	-4.0%		
Private Debt⁴	\$1,516,300,726	4.4%	3.0%	1.4%		
Opportunistic Debt^{4,6}	\$1,076,562,804	3.1%	0.0%	3.1%	0% - 10%	Yes
Total Fixed Income	\$7,806,927,376	22.5%	26.0%	-3.5%	15% - 35%	Yes
Commodities²	\$751,232,165	2.2%	4.0%	-1.8%	1% - 7%	Yes
Real Estate^{2,4}	\$2,068,637,770	6.0%	6.0%	0.0%	6% - 10%	Yes
Infrastructure	\$300,000,000	0.9%	0.0%	0.9%	0% - 3%	Yes
Farmland and Timber	\$149,770,674	0.4%	0.0%	0.4%	0% - 3%	Yes
Opportunistic Inflation-Linked⁵	\$0	0.0%	0.0%	0.0%	0% - 3%	Yes
Total Inflation-Linked	\$3,269,640,609	9.4%	10.0%	-0.6%	8% - 16%	Yes
Cash⁵	\$419,096,546	1.2%	0.0%	1.2%		
Operating Cash (Non-Assetized)	\$100,828,001	0.3%	0.0%	0.3%		
Operating Cash (Assetized)	\$318,268,545	0.9%	0.0%	0.9%		
Total	\$34,738,889,501	100.0%	100.0%	0.0%		
Global Tactical Asset Allocation (GTAA)²	\$3,378,389,228	9.7%	10.0%	-0.3%	5% - 15%	Yes

¹Total Domestic and International Equity includes Equity Risk Factor Portfolio with assets of \$557.1 million.
²GTAA allocation distributed into U.S. Large Cap Equity, Int'l Developed Large Cap Equity, Core Fixed Income, Commodities and Real Estate.
³Domestic Equity, International Equity, U.S. Fixed Income and Emerging Market Debt market values include residual values remaining in terminated manager accounts.
⁴Values shown for private markets portfolios include cash flows that occurred during 1Q 2015.
⁵Cash includes money for the upcoming monthly pension distribution.
⁶Aggregate Opportunistic asset classes not to exceed 10%.
 Note: Interim SAA Policy includes proration of 1% Private Equity and 2% Real Estate, which are unfunded. Policy Ranges shown are relative to the long-term SAAP, which can cause some asset classes to be out of range while implementation of the long-term SAAP is in process.
 Current Market Value and Current Allocation are based on unaudited values as of March 31, 2015. Data shown above will differ from what is presented in the 1Q 2015 Board Report that is scheduled to be presented at the June 26, 2015 Board meeting.
 Market values include manager held cash.

- **Four Asset Class Committee meetings have been held since the last time we provided an update on the ASRS Asset Class Committee Meetings.**

- **February 27, 2015 – Private Markets Committee**
 - Monthly Status Report, General Discussion and Deal Flow
 - Real Estate Pipeline Discussion
 - Informational item to provide an update on real estate investment pipeline and to solicit guidance as necessary
 - Real Estate Manager Recommendation (\$100 million)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Real Estate is 10%)
 - The ASRS is currently invested with this manager in multiple funds across the ASRS private markets landscape
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
 - Variance Request
 - RCLCO and the ASRS private markets team recommended the ASRS approve a variance request from an existing real estate manager to amend the financing criteria required to make an investment
 - Availability of bank debt remains highly constrained, and in order to obtain debt for this particular account, cross collateralized fund level debt is required
 - Committee approved the variance request, allowing up to \$75 million of ASRS capital to be invested in entities with a cross collateralized bank loan limited to an amount no greater than 45% loan to cost
 - Private Equity Manager Recommendation (\$50-\$75 million)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 8%)
 - The ASRS is currently invested with this manager in a prior fund
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation for \$50 million, delegating authority for the private markets team to increase the size of the investment up to \$75 million after an evaluation of the potential benefit of a fee break for increasing the size of the commitment

- **February 27, 2015 – Private Markets Committee (continued)**

- Private Debt Manager Recommendation – Additional Commitment (\$400 million; \$600 million original commitment)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Debt is 10%)
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
- Private Debt Manager Recommendation – Additional Commitment (\$200 million; \$300 million original commitment)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Debt is 10%)
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation

- **March 19, 2015 – Ad Hoc Private Markets Committee**

- Private Debt Manager Recommendation (\$350 million)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Debt is 10%)
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation, subject to the concurrence of the Director, who was not present for the discussion. The Director subsequently concurred at the March 20, 2015 PRIVMC meeting.
- Private Debt Manager Recommendation (\$350 million)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Debt is 10%)
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - No recommendation was made at this meeting

- **March 20, 2015 – Private Markets Committee**

- Monthly Status Report, General Discussion and Deal Flow
- Real Estate Pipeline Discussion
 - Informational item to provide an update on real estate investment pipeline and to solicit guidance where appropriate
- Real Estate Manager Recommendation – Additional Commitment (\$100 million; \$100 million original commitment)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Real Estate is 10%)
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
- Private Debt Manager Recommendation (\$350 million)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Debt is 10%)
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
- Private Equity Manager Recommendation (\$100 million)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 8%)
 - The ASRS is currently invested with this manager in prior funds
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
- Private Equity Manager Recommendation (\$80 million)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 8%)
 - The ASRS is currently invested with this manager in multiple funds across the ASRS private markets landscape
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation

• **March 20, 2015 – Private Markets Committee (continued)**

- Private Equity Manager Recommendation (\$100 million)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 8%)
 - The ASRS is currently invested with this manager in a prior fund
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
- Opportunistic Equity Manager Recommendation (\$30 million co-investment)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Opportunistic Equity is 0%, with a range of 0%-3%)
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
- Variance Request
 - RCLCO recommended the ASRS approve a variance request from an existing real estate manager to allow for the continued development of a property that will require a longer period of time to achieve stabilization than the investment guidelines require
 - Investment in question will require 4-5 years to achieve stabilization, while investment criteria require stabilization within 3 years
 - This was an error in the investment criteria language, which should have read that these types of investments will ‘achieve stabilization within 3 years of completion of construction’ rather than 3 years from the date of the initial investment in the asset
 - The Committee did not approve the variance request, but instead amended the investment criteria language accordingly
- Private Debt Manager Recommendation (\$350 million) – Follow Up from March 19, 2015 PRIVMC meeting
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Debt is 10%)
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation

- **March 27, 2015 – Private Markets Committee**

- Real Estate Pipeline Discussion
 - Informational item to provide an update on real estate investment pipeline and to solicit guidance where appropriate
- Real Estate Manager Recommendation – Additional Commitment (\$100 million; \$100 million original commitment)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Real Estate is 10%)
 - The ASRS is currently invested with this manager in multiple funds across the ASRS private markets landscape
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation
- Real Estate Manager Recommendation – (\$300 million)
 - Consistent with strategic plan at the Total Fund level (SAAP Target to Real Estate is 10%)
 - Due diligence process was followed in accordance with SIP 006 – Investment Manager, Partner, and Co-Investment Selection and Oversight
 - Committee approved the recommendation

General Observations

- **The Fund continues to make significant progress moving the portfolio from the Interim SAAP toward the long-term SAAP.**
 - Current Interim SAAP includes proration of 1% Private Equity and 2% Real Estate, which are unfunded.
 - Continued build out of private markets asset classes provides opportunity to take advantage of illiquidity premium to produce expected returns in excess of what we believe can be achieved in the public markets.
- **IMD has already taken significant steps to move the Fund toward implementation of the recently approved SAAP.**
 - The largest single underweight position in the Fund is Private Debt, which was increased from a 3% SAAP target to a 10% SAAP target (current actual is 4.4%).
 - \$3.7 billion in estimated exposure (9/30/2014 NAV + unfunded commitments) to private debt strategies equates to approximately 10.7% of Total Fund assets vs. the SAAP target of 10%.
 - Emerging Market Debt investment managers have been liquidated as the asset class was removed from the SAAP.
 - Multi-Asset Class Strategies (formerly GTAA) has been restructured and moved 'above the line' and now has an explicit 5% target within the SAAP.
- **Cash Assetization Program implemented:**
 - To facilitate fund liquidity by decreasing the settlement times and market frictions related to overall investment management.
 - To retain unleveraged Total Fund market (beta) exposure, and concurrently offset the hindrance on investment performance from maintaining sizeable transitional cash balances intended to meet fund payment obligations (e.g., pension, health supplement, LTD, fees, accounts payable and associated capital calls).
- **Tactical positioning consistent with IMD House Views.**

Market Environment Update



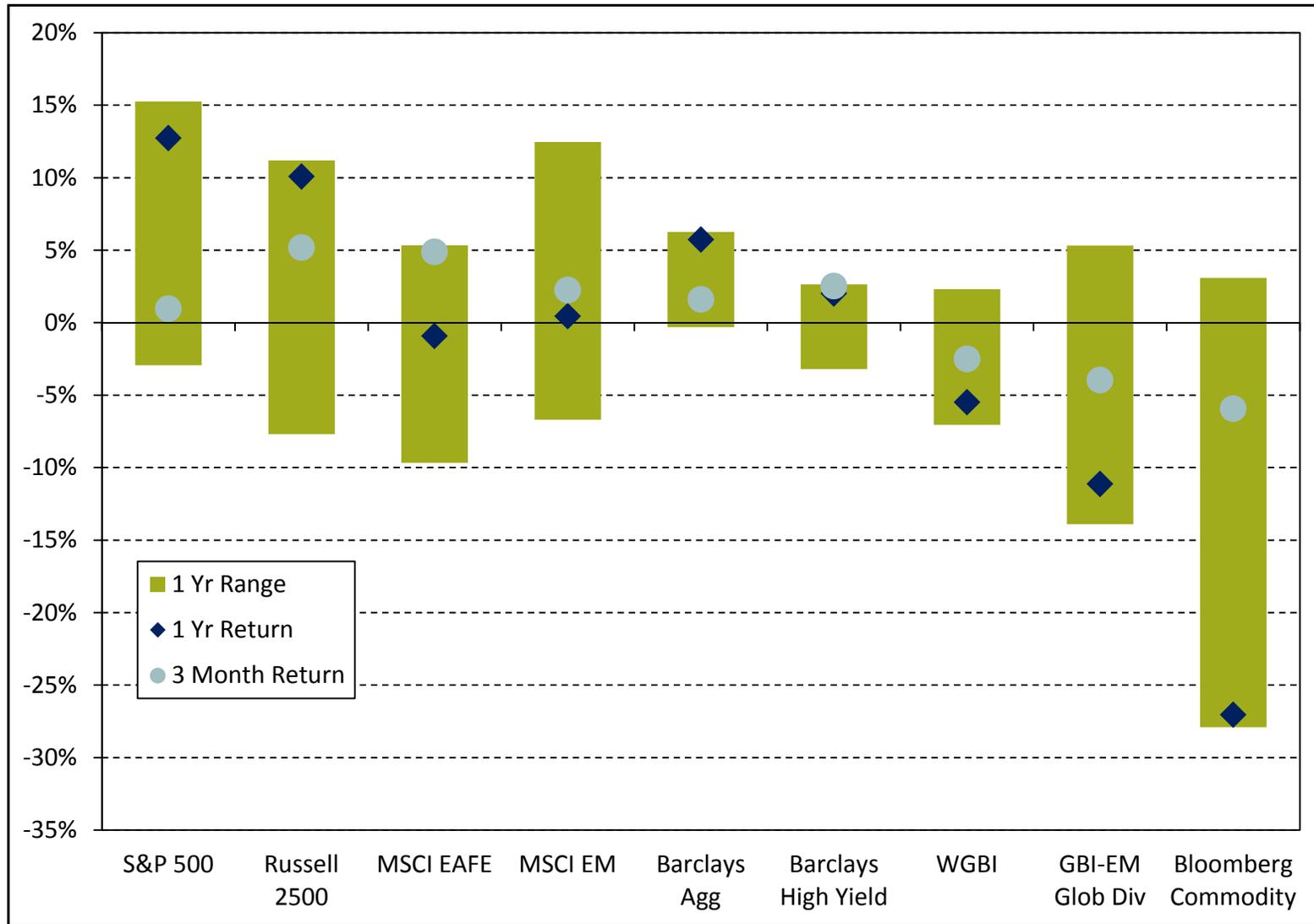
- **Global equities were mostly negative on the month outside of U.S. small cap issues**
 - Economic growth concerns weighed on many developed markets while a strong U.S. dollar appeared to challenge large U.S.-based multinationals
- **Commodity prices remained in flux, driven by a further decline in oil as crude fell to \$47.60 per barrel at month end**
 - Persistent low energy prices along with currency weakness weighed on the emerging markets, driving losses in both equity and fixed income indices
- **The 10 year Treasury yield fell from 2.00% to 1.94% over the course of the month, providing a modest tailwind to broad U.S. fixed income markets**
- **The Federal Reserve struck a cautiously optimistic tone in its mid-March statement, indicating it will wait on further employment and inflation indicators before raising rates**
 - Fourth quarter GDP growth was revised down to 2.2% with concerns of a strong dollar softening economic growth projections

Index Performance Summary as of 3/31/2015

	2008	2009	2010	2011	2012	2013	2014	JAN	FEB	MAR	YTD
Barclays US Strips 20+	59.5%	-36.0%	10.9%	58.5%	3.0%	-21.0%	46.4%	13.8%	-8.5%	1.4%	5.5%
Russell 2500	-36.8%	34.4%	26.7%	-2.5%	17.9%	36.8%	7.1%	-2.1%	6.0%	1.3%	5.2%
MSCI EAFE	-43.4%	31.8%	7.8%	-12.1%	17.3%	22.8%	-4.9%	0.5%	6.0%	-1.5%	4.9%
FTSE NAREIT Equity REITs	-37.7%	28.0%	28.0%	8.3%	18.1%	2.5%	30.1%	6.7%	-3.5%	1.7%	4.8%
Russell 2000	-33.8%	27.2%	26.9%	-4.2%	16.4%	38.8%	4.9%	-3.2%	5.9%	1.7%	4.3%
Barclays US Govt/Credit Long	8.4%	1.9%	10.2%	22.5%	8.8%	-8.8%	19.3%	6.4%	-3.4%	0.5%	3.4%
Barclays US Long Credit	-3.9%	16.8%	10.7%	17.1%	12.7%	-6.6%	16.4%	5.2%	-2.3%	0.2%	3.1%
Barclays US Corp High Yield	-26.2%	58.2%	15.1%	5.0%	15.8%	7.4%	2.5%	0.7%	2.4%	-0.6%	2.5%
MSCI EM	-53.3%	78.5%	18.9%	-18.4%	18.2%	-2.6%	-2.2%	0.6%	3.1%	-1.4%	2.2%
Credit Suisse Lev Loan	-28.8%	44.9%	10.0%	1.8%	9.4%	6.2%	2.1%	0.3%	1.4%	0.4%	2.1%
JPM EMBI Global Div	-12.0%	29.8%	12.2%	7.4%	17.4%	-5.3%	7.4%	0.9%	0.9%	0.2%	2.0%
Credit Suisse Hedge Fund	-19.1%	18.6%	11.0%	-2.5%	7.7%	9.7%	4.1%	0.8%	1.1%	1.1%	1.9%
Barclays US Agg Bond	5.2%	5.9%	6.5%	7.8%	4.2%	-2.0%	6.0%	2.1%	-0.9%	0.5%	1.6%
Russell 1000	-37.6%	28.4%	16.1%	1.5%	16.4%	33.1%	13.2%	-2.8%	5.8%	-1.3%	1.6%
Barclays US Govt/Credit Interm	5.1%	5.2%	5.9%	5.8%	3.9%	-0.9%	3.1%	1.7%	-0.7%	0.5%	1.5%
Barclays US Agg Interm	4.9%	6.5%	6.2%	6.0%	3.6%	-1.0%	4.1%	1.4%	-0.5%	0.5%	1.3%
Barclays Municipal	-2.5%	12.9%	2.4%	10.7%	6.8%	-2.6%	9.1%	1.8%	-1.0%	0.3%	1.0%
Barclays Govt/Credit 1-5 Yr	5.1%	4.6%	4.1%	3.1%	2.2%	0.3%	1.4%	1.0%	-0.4%	0.4%	1.0%
S&P 500	-37.0%	26.5%	15.1%	2.1%	16.0%	32.4%	13.7%	-3.0%	5.8%	-1.6%	1.0%
Barclays US Govt/Credit 1-3 Yr	5.0%	3.8%	2.8%	1.6%	1.3%	0.6%	0.8%	0.5%	-0.2%	0.2%	0.6%
Citi WGBI	10.9%	2.6%	5.2%	6.4%	1.7%	-4.0%	-0.5%	-0.3%	-1.1%	-1.1%	-2.5%
JPM GBI EM Global Div	-5.2%	22.0%	15.7%	-1.8%	16.8%	-9.0%	-5.7%	0.3%	-1.3%	-3.0%	-4.0%
Alerian MLP	-36.9%	76.4%	35.9%	13.9%	4.8%	27.6%	4.8%	-3.1%	2.1%	-4.2%	-5.2%
Bloomberg Commodity	-35.7%	18.9%	16.8%	-13.3%	-1.1%	-9.5%	-17.0%	-3.3%	2.6%	-5.1%	-5.9%

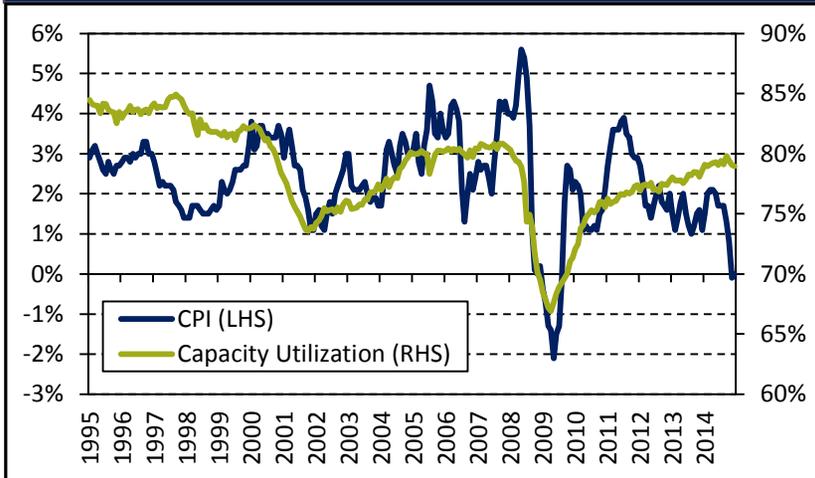
Source: Morningstar Direct

Broad Market Performance Summary as of 3/31/2015



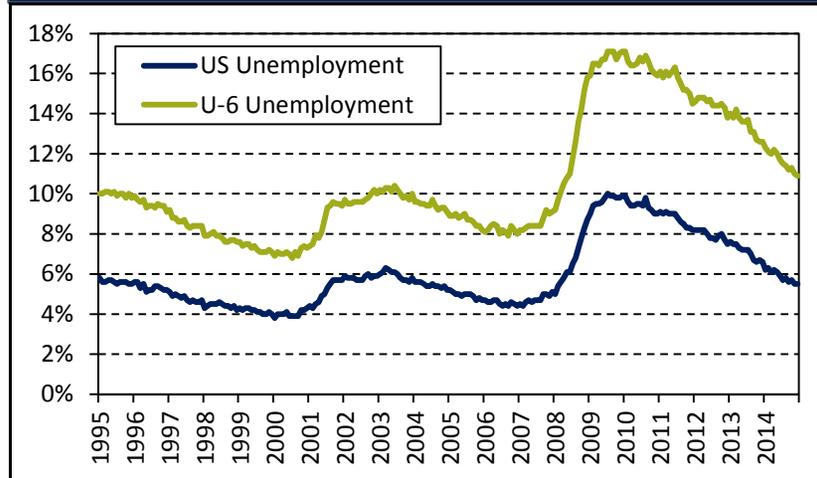
Source: Bloomberg, Standard and Poors, Russell, MSCI, Barclays, Citigroup, JP Morgan
 *1 Yr Range: Represents range of cumulative high/low daily index returns for an investment made one year ago

Inflation has stayed low



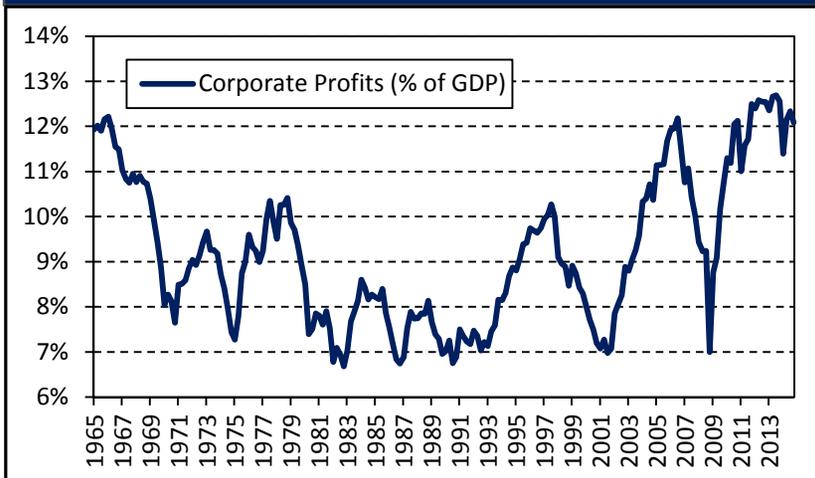
Source: Bloomberg, Federal Reserve, Bureau of Labor Statistics

Unemployment steadily improving



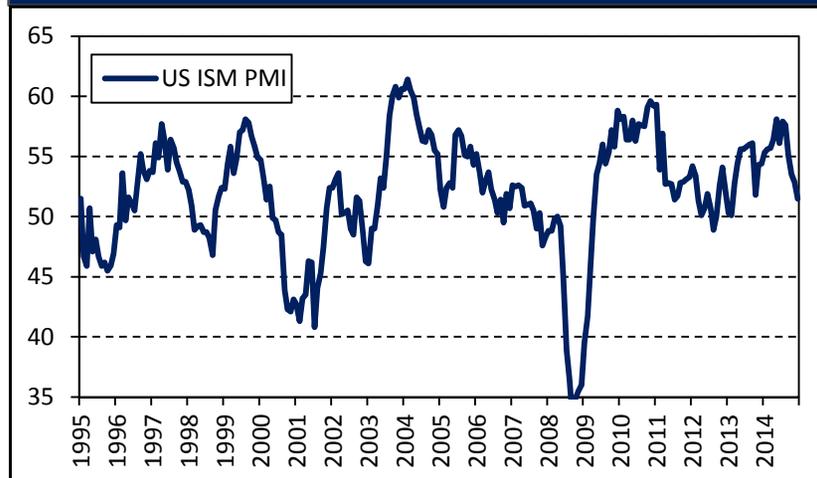
Source: Bloomberg, Bureau of Labor Statistics

Corporate profits at secular highs



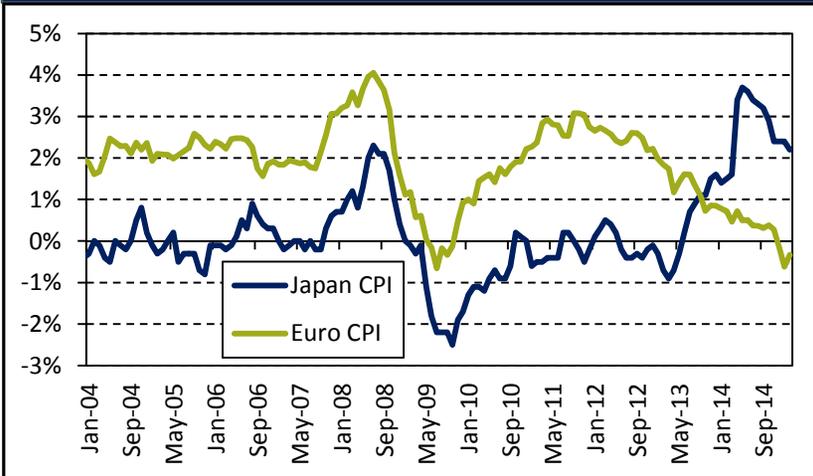
Source: Bloomberg, Bureau of Economic Analysis

Manufacturing above average but trending down



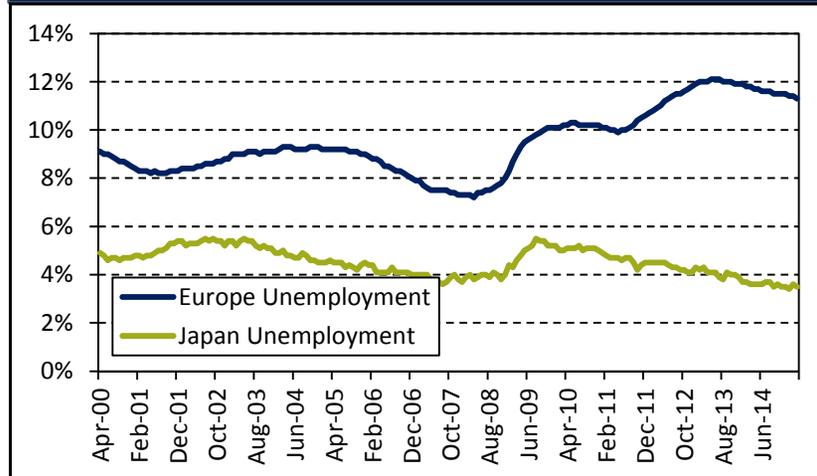
Source: Bloomberg, Institute for Supply Management

Deflation remains a concern



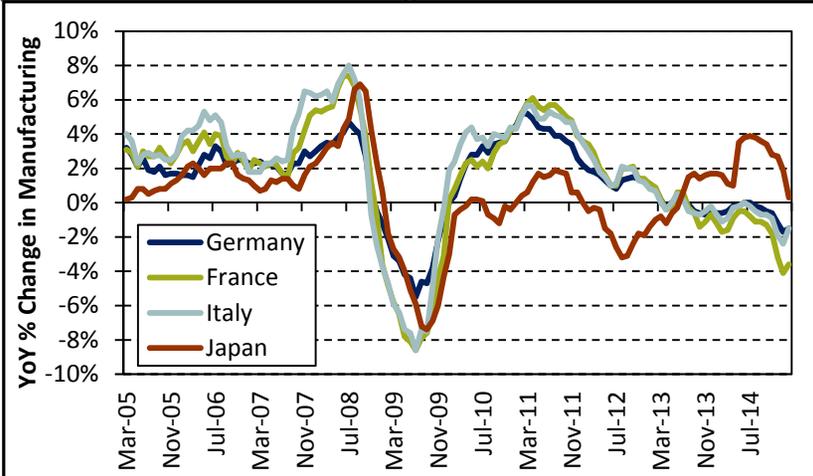
Source: Bloomberg, Japan Ministry of Internal Affairs and Communications, Eurostat

Europe employment recovery lagging



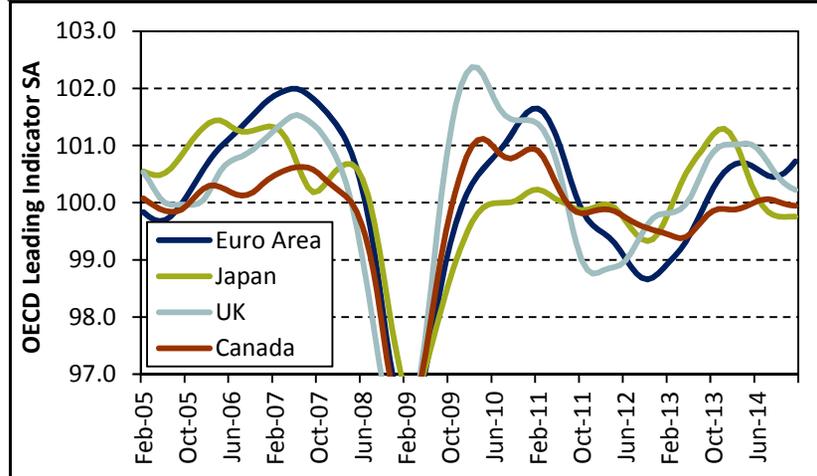
Source: Bloomberg, Japan Ministry of Internal Affairs and Communications, Eurostat

Manufacturing subdued in Europe but rising off lows



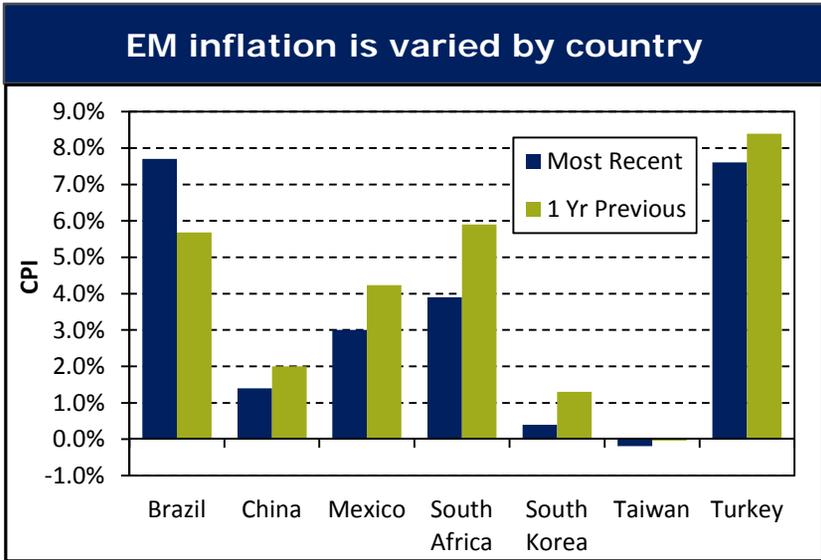
Source: Bloomberg, OECD, Eurostat

Leading indicators neutral to positive

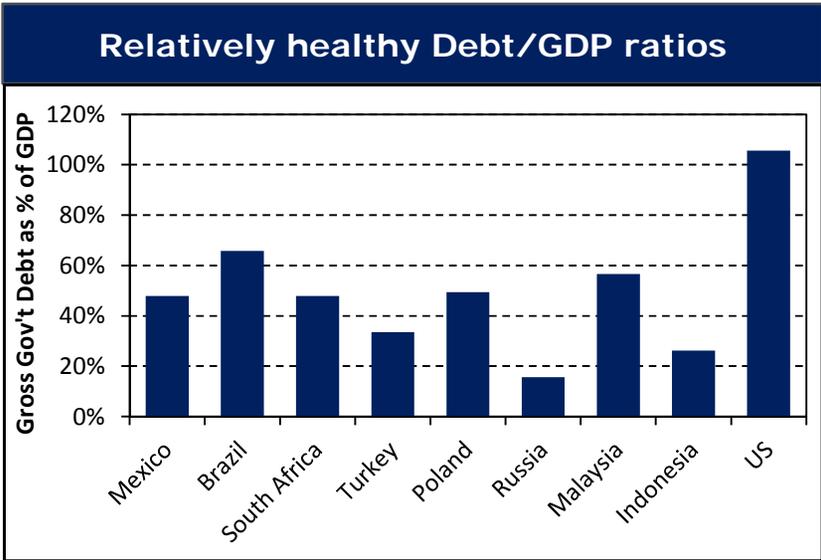


Source: Bloomberg, OECD

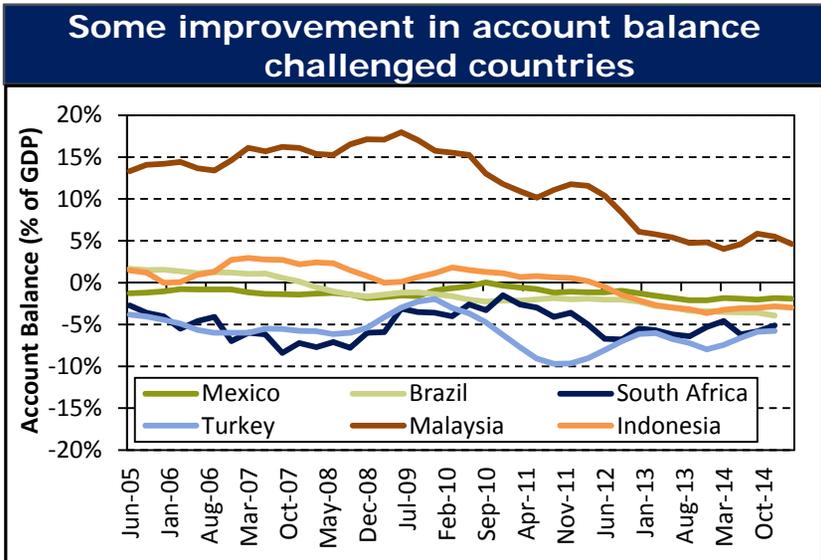
Emerging Market Economic Indicators



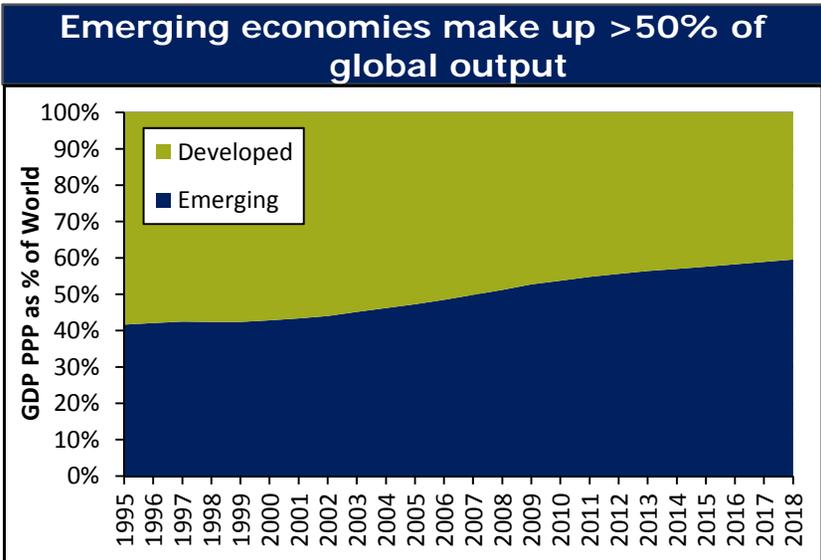
Source: Bloomberg



Source: Bloomberg, IMF



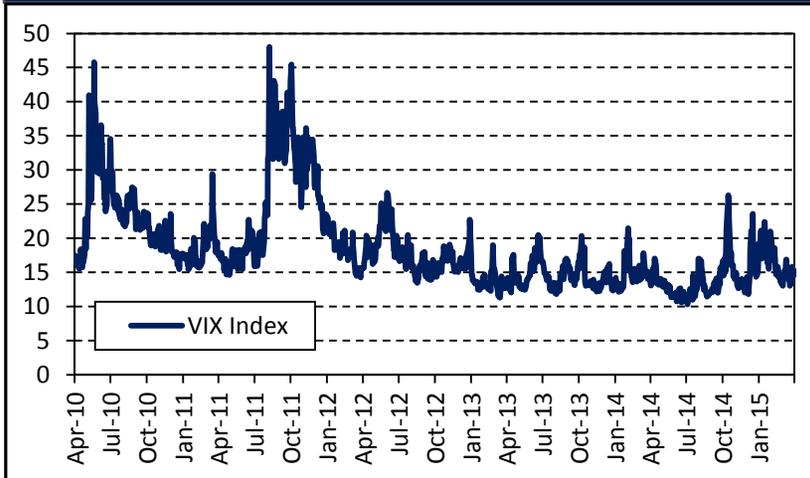
Source: Bloomberg



Source: Bloomberg, IMF

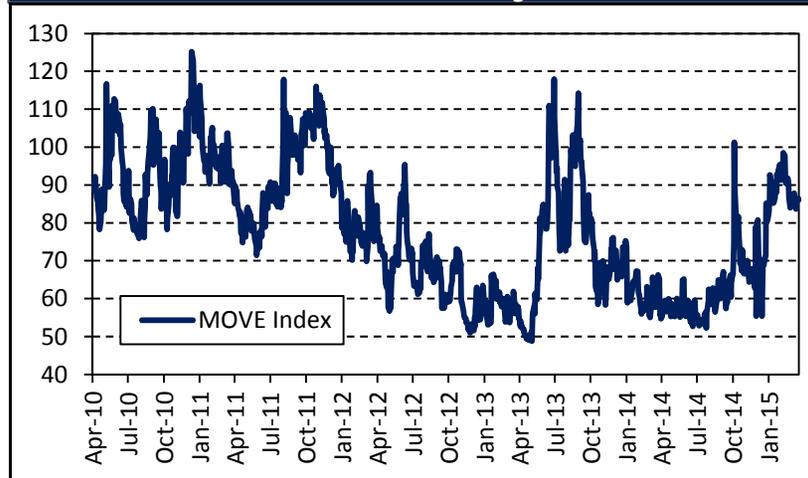
Volatility

Equity volatility remains low



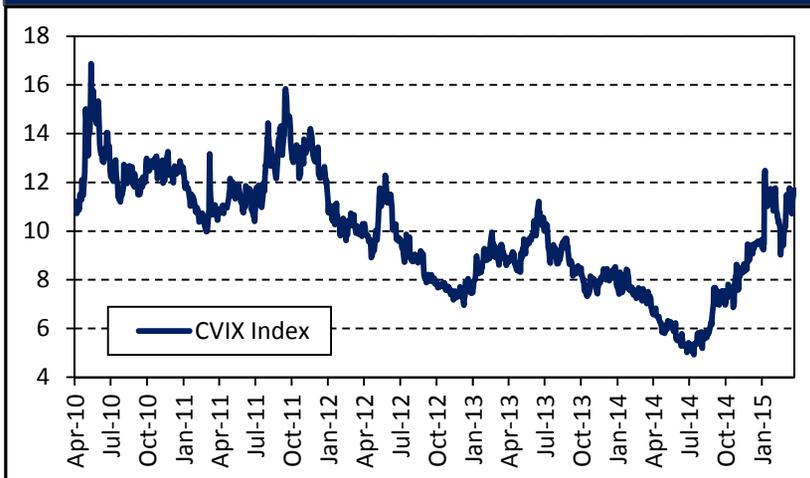
Source: Bloomberg, CBOE

Treasury rates experiencing higher volatility



Source: Bloomberg, Merrill Lynch

Recent uptick in currency volatilities



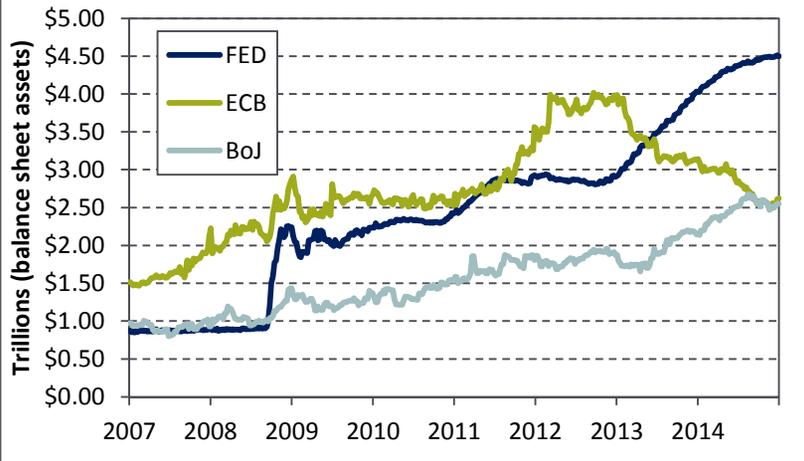
Source: Bloomberg, Deutsche Bank

Commodity pricing volatility has increased



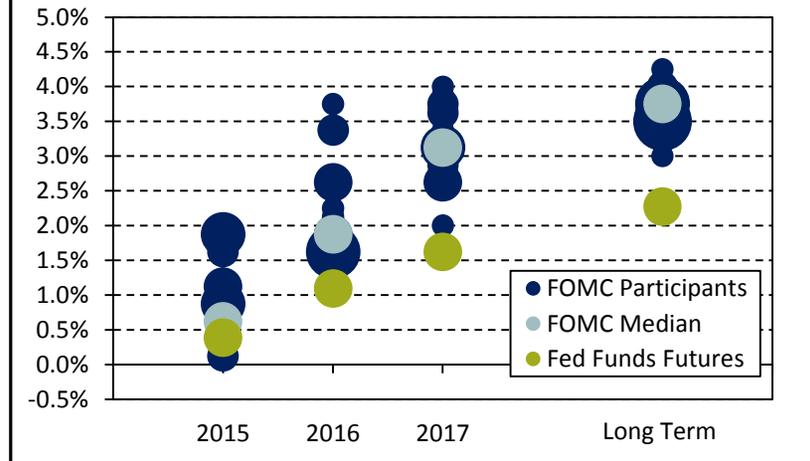
Source: Bloomberg, Merrill Lynch

Major central bank policy divergence



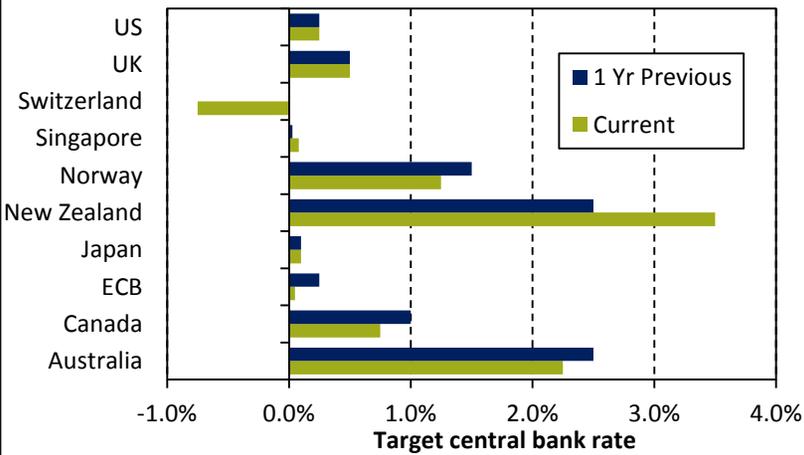
Source: Bloomberg, Federal Reserve, Bank of Japan, ECB, NEPC

Fed's ideal rate of policy firming above market expectations



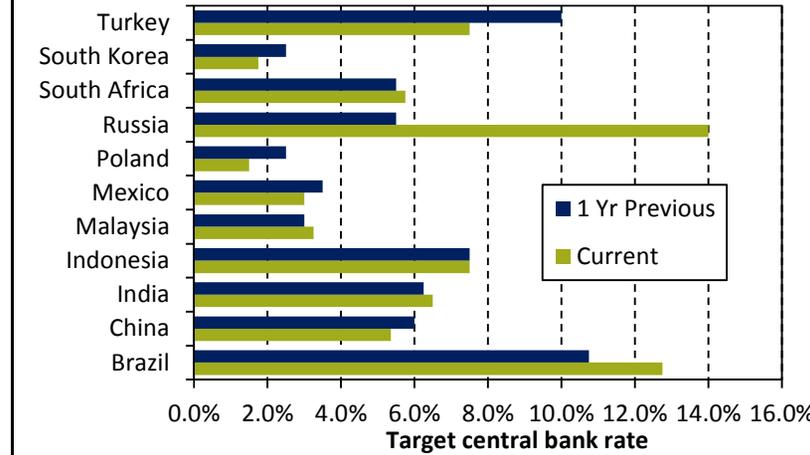
Source: Bloomberg, Federal Reserve, NEPC

Many developed central banks have maintained low interest rates



Source: Bloomberg

EM central bank policies have varied by circumstance



Source: Bloomberg

Appendix: SAA Policy History



Strategic Asset Allocation Policy (SAAP) History

- 7/1/75 – 12/31/79 – 40% S&P 500/60% Barclays Capital Aggregate
- 1/1/80 – 12/31/83 – 50% S&P 500/50% Barclays Capital Aggregate
- 1/1/84 – 12/31/91 – 60% S&P 500/40% Barclays Capital Aggregate
- 1/1/92 – 12/31/94 – 50% S&P 500/10% MSCI EAFE/40% Barclays Capital Aggregate
- 1/1/95 – 6/30/97 – 45% S&P 500/15% MSCI EAFE/40% Barclays Capital Aggregate
- 7/1/97 – 12/31/99 – 50% S&P 500/15% MSCI EAFE/35% Barclays Capital Aggregate
- 1/1/00 – 9/30/03 – 53% S&P 500/17% MSCI EAFE/30% Barclays Capital Aggregate
- 10/1/03 – 12/31/06 – 53% S&P 500/15% MSCI EAFE/ACWI ex-U.S.¹/26% Barclays Capital Aggregate/6% NCREIF ODCE (lagged one quarter)
- 1/1/07 – 10/31/2009 – 31% S&P 500/7% S&P 400/7% S&P 600/18% MSCI ACWI ex-U.S./5% Russell 2000 (lagged one quarter)/26% Barclays Capital Aggregate/6% NCREIF ODCE (lagged one quarter)
- 11/1/2009 – 6/30/2012 – 28% S&P 500/6% S&P 400/6% S&P 600/13% MSCI EAFE/2% MSCI EAFE Small Cap/3% MSCI Emerging Markets/7% Russell 2000 (lagged one quarter)/24% Barclays Capital Aggregate/2% Barclays Capital High Yield/6% NCREIF ODCE (lagged one quarter)/3% Dow Jones/UBS Commodities Index
- 7/1/2012 – 3/31/2015 – 23% S&P 500/5% S&P 400/5% S&P 600/14% MSCI EAFE/3% MSCI EAFE Small Cap/6% MSCI Emerging Markets/7% Russell 2000 (lagged one quarter)/13% Barclays Capital Aggregate/5% Barclays Capital High Yield/4% JP Morgan GBI-EM Global Diversified/3% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter)/8% NCREIF ODCE (lagged one quarter)/4% Dow Jones/UBS Commodities Index
- **4/1/2015 - present – 20% S&P 500/3% S&P 400/3% S&P 600/17% MSCI EAFE/2% MSCI EAFE Small Cap/5% MSCI Emerging Markets/8% Russell 2000 (lagged one quarter)/11% Barclays Capital Aggregate/4% Barclays Capital High Yield/10% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter)/10% NCREIF ODCE (lagged one quarter)/2% Bloomberg Commodities Index TR/5% Multi-Asset Class Custom Index**
- *Interim SAA Policy: 25% S&P 500/5% S&P 400/5% S&P 600/14% MSCI EAFE/3% MSCI EAFE Small Cap/6% MSCI Emerging Markets/6% Russell 2000 (lagged one quarter)/14% Barclays Capital Aggregate/5% Barclays Capital High Yield/4% JP Morgan GBI-EM Global Diversified/3% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter)/6% NCREIF ODCE (lagged one quarter)/4% Bloomberg Commodity Index

Note: Interim SAA Policy includes proration of 1% Private Equity and 2% Real Estate, which are unfunded. Private Equity was prorated to domestic equity; Real Estate was prorated to domestic equity and fixed income. Recently approved Strategic Asset Allocation Policy effective April 1, 2015.

¹MSCI EAFE/ACWI ex-U.S. Benchmark is the MSCI EAFE Index prior to 10/1/2005 and the MSCI ACWI ex-U.S. thereafter.

Note: All MSCI indices changed from Gross to Net dividend withholding taxes effective 1/1/2014.

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