ARIZONA STATE RETIREMENT SYSTEM

3300 NORTH CENTRAL AVENUE • PO BOX 33910 • PHOENIX, AZ 85067-3910 • PHONE (602) 240-2000
7660 EAST BROADWAY BOULEVARD • SUITE 108 • TUCSON, AZ 85710-3776 • PHONE (520) 239-3100
TOLL FREE OUTSIDE METRO PHOENIX AND TUCSON 1 (800) 621-3778
EMAIL ADDRESS: ASKMAC@AZASRS.GOV • WEB ADDRESS: WWW. AZASRS.GOV

Paul Matson
Director

AGENDA

NOTICE OF A PUBLIC MEETING OF THE
ARIZONA STATE RETIREMENT SYSTEM (ASRS)
INVESTMENT COMMITTEE

3300 North Central Avenue
14th Floor Conference Room
Phoenix, Arizona 85012

Monday, April 21, 2014
2:30 p.m.

Pursuant to A.R.S. § 38-431.02, notice is hereby given to the members of the Arizona State Retirement System (ASRS) Investment Committee (IC) and to the general public that the ASRS Investment Committee will hold a public meeting April 21, 2014 beginning at 2:30 p.m., in the 14th Floor Conference Room of the Arizona State Retirement System office, 3300 North Central Avenue, Phoenix, Arizona. Trustees of the Committee may attend either in person or by telephone conference call.

This is a regularly scheduled meeting of the Investment Committee; however, due to possible attendance by other ASRS Board Trustees, this meeting may technically become a meeting of the Board or one of its Committees. Actions taken will be consistent with Investment Committee governance procedures. Actions requiring Board authority will be presented to the full Board for final decision.

The Chair may take public comment during any agenda item. If any member of the public wishes to speak to a particular agenda item, they should complete a Request to Speak form indicating the item and provide it to the Committee Administrator.

This meeting will be teleconferenced to the ASRS office in Tucson, 7660 E. Broadway Blvd., Suite 108, Tucson, AZ 85710. The conference call to Tucson will be disconnected after 15 minutes if there are no attendees in the Tucson audience.

The Agenda for the meeting is as follows:

1. Call to Order; Roll Call (estimated time 4 min. to 2.34 p.m.) ....Mr. Tom Connelly
Chair, Investment Committee

2. Approval of Minutes of the February 20, 2014 Public and Executive Session Meetings and the February 24, 2014 Public Meeting (Action item; estimated time 1 min. to 2:35 p.m.) ....
....Mr. Tom Connelly

3. Presentation and Roundtable Discussion Regarding the Federal Reserve Balance Sheet, its Management, and Monetary Policy (Informational and discussion item; estimated time 120 min. to 4:35 p.m.) .... Mr. Gary Dokes
Chief Investment Officer, ASRS
.... Mr. William Poole
Senior Advisor, Merk Investments
.... Mr. Michael Cembalist
Chairman of Market and Investment Strategy, J.P. Morgan
.... Mr. Kurt Winkelman
Head of Risk and Analytical Research, MSCI

4. Presentation, Discussion, and Appropriate Action Regarding ASRS Investment Program Updates (Informational and discussion item; estimated time 15 min. to 4:50 p.m.) ....
.... Mr. Paul Matson
Director, ASRS
.... Mr. Gary Dokes
.... Mr. Dave Underwood
Portfolio Manager of Fixed Income, ASRS
.... Mr. Karl Polen
Head of Private Markets Investing, ASRS
.... Mr. Eric Glass
Portfolio Manager of Private Markets, ASRS
.... Mr. Kien Trinh
Assistant Vice President, Risk Services, State Street Investment Analytics
   a. ASRS Fund Positioning
   b. IMD Investment House Views
   c. Asset Class Committee (ACC) Activities
   d. Tactical Portfolio Positioning
   e. IMD Projects, Research, and Initiatives
   f. Investment Risk Reports and Securities Lending Risk Metrics

Regarding the following agenda item, pursuant to A.R.S. § 38-431.03(A)(2) and A.R.S. § 38-718(P) notice is hereby given to Trustees of the ASRS Investment Committee and the general public that the ASRS Investment Committee may vote to go into executive session, in the event specific manager data is discussed that is deemed confidential/non-public information. The executive session will take place in the 14th floor conference room.

5. Presentation, Discussion, and Appropriate Action Regarding Independent Reporting, Monitoring and Oversight of the ASRS Investment Program (Informational and discussion item; estimated time 15 min. to 5:05 p.m.) .... Mr. Allan Martin
Partner, NEPC
.... Mr. Dan LeBeau
Consultant, NEPC

6. Presentation, Discussion, and Appropriate Action Regarding Total Equities Asset Class Presentation (Informational and discussion item; estimated time 45 min. to 5:50 p.m.) ....Mr. Gary Dokes
.... Mr. Dave Underwood
.... Mr. Karl Polen
....Mr. Keith Guido
Assistant Portfolio Manager of Public Equity, ASRS
....Mr. Allan Martin
....Mr. Dan LeBeau

7. Requests for Future Agenda Items (Informational and discussion item; estimated time 5 min. to 5:55 p.m.)..Mr. Tom Connelly
....Mr. Gary Dokes

8. Call to the Public ....Mr. Tom Connelly

Those wishing to address the ASRS Committee are required to complete a Request to Speak form before the meeting indicating their desire to speak. Request to Speak forms are available at the sign-in desk and should be given to the Committee Administrator. Trustees of the Committee are prohibited by A.R.S. § 38-431.01(G) from discussing or taking legal action on matters raised during an open call to the public unless the matters are properly noticed for discussion and legal action. As a result of public comment, the Committee Chair may direct staff to study and/or reschedule the matter for discussion and decision at a later date.

9. The next ASRS Investment Committee Meeting is scheduled for Monday, June 23, 2014 at 2:30 p.m., at 3300 N. Central Avenue, 14th Floor Conference room, Phoenix, Arizona.

10. Adjournment of the ASRS Investment Committee Meeting

A copy of the agenda background material provided to Committee Trustees (with the exception of material relating to possible executive sessions) is available for public inspection at the ASRS offices located at 3300 North Central Avenue, 14th Floor, Phoenix, Arizona, and 7660 East Broadway Boulevard, Suite 108, Tucson, Arizona. The agenda is subject to revision up to 24 hours prior to meeting. These materials are also available on the ASRS website (https://www.azasrs.gov/web/BoardCommittees.do) approximately 48 hours prior to the meeting.

Persons with a disability may request a reasonable accommodation such as a sign language interpreter or alternate formats of this document by contacting Tracy Darmer, ADA Coordinator at (602) 240-5378 in Phoenix, at (520) 239-3100, ext. 5378 in Tucson or 1-800-621-3778, ext. 5378 outside metro Phoenix or Tucson. Requests should be made as early as possible to allow time to arrange the accommodations.

Dated April 11, 2014

ARIZONA STATE RETIREMENT SYSTEM

Gloria Trujillo Committee Administrator	Gary Dokes Chief Investment Officer

ARIZONA STATE RETIREMENT SYSTEM

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Paul Matson
Director

MINUTES OF THE PUBLIC MEETING OF THE
ARIZONA STATE RETIREMENT SYSTEM
INVESTMENT COMMITTEE

HELD ON

Friday, February 20, 2014
8:30 a.m.

The Arizona State Retirement System (ASRS) Investment Committee (IC) met at 3300 N. Central Avenue, 14th Floor, Phoenix, AZ 85012. Mr. Tom Connelly, Chair, called the meeting to order at 8:34 a.m.

1. Call to Order; Roll Call; Opening Remarks

Present: Mr. Tom Connelly, Chair (via teleconference)
Prof. Dennis Hoffman, Vice-chair (via teleconference)

Absent: Mr. Marc Boatwright

A quorum was present for the purpose of conducting business.

Also in attendance was Board Trustee Dr. Richard Jacob.

2. Presentation, Discussion, and Appropriate Action Regarding the General Investment Consulting Request for Proposal (RFP)

Pursuant to A.R.S. § 38-431.03(A)(2) the IC voted to go into executive session, for the purpose of considering or discussing records exempt by law from public inspection.

Motion: Prof. Dennis Hoffman moved to go into executive session. Mr. Tom Connelly seconded the motion.

By a vote of 2 in favor, 0 opposed, 0 abstentions, and 1 excused, the motion was approved.

The Board recessed from the public meeting at 8:35 a.m. for the purpose of going into executive session.

The Board returned to the public meeting at 9:51 a.m.

Mr. Tom Connelly adjourned meeting at 9:52 a.m.

Respectfully submitted,

ARIZONA STATE RETIREMENT SYSTEM

Gloria Trujillo	Date	Gary Dokes	Date
Investment Committee Administrator		Chief Investment Officer	

Confidential Meeting Materials Removed

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Paul Matson
Director

MINUTES OF THE PUBLIC MEETING OF THE
ARIZONA STATE RETIREMENT SYSTEM
INVESTMENT COMMITTEE

HELD ON

Monday, February 24, 2014

2:30 p.m.

The Arizona State Retirement System (ASRS) Investment Committee (IC) met at 3300 N. Central Avenue, 14th Floor, Phoenix, AZ 85012. Mr. Tom Connelly, Chair of the IC, called the meeting to order at 2:30 p.m.

1. Call to Order; Roll Call; Opening Remarks

Present: Mr. Tom Connelly, Chair
Prof. Dennis Hoffman, Vice-Chair (via teleconference)

Absent: Mr. Marc Boatwright

A quorum was present for the purpose of conducting business.

Also in attendance was Board Trustee Dr. Richard Jacob.

2. Approval of Minutes of the November 18, 2013 Investment Committee Meeting and the January 31, 2014 Investment Committee and Executive Session Meeting.

Motion: Mr. Dennis Hoffman moved to approve the minutes of the November 18, 2013 Investment Committee Meeting and the January 31, 2014 Investment Committee and Executive Session Meeting. Mr. Tom Connelly seconded the motion.

By a vote of 2 in favor, 0 opposed, 0 abstentions, 1 excused, the motion was approved.

3. Presentation, Discussion, and Appropriate Action Regarding ASRS Investment Program Updates

Mr. Gary Dokes, ASRS Chief Investment Officer, provided an overview of the ASRS investment program as it related to Asset Class Committees, tactical portfolio positioning, IMD belief systems, IMD House Views, IMD projects, activities and research initiatives.

Mr. Dave Underwood, Assistant CIO, gave a brief overview of the current portfolio posture for equities, and noted the trend as being solid and recovering. Mr. Karl Polen, Head of Private Markets Investing, presented information on the portfolio stance for private equity including real estate and commodities, as well as the decision for the ASRS to proceed with investments in land banking arrangements for home construction firms.

Mr. Kien Trinh, State Street Assistant Vice President, provided an overview of the State Street Risk Report, dated as of December 31, 2013. He discussed the monthly reallocation summary, month-end risk profile, and total plan overview on exposure, as well as a scenario analysis to allow for a better view of potential risk factors based on various scenarios.

Mr. Tom Connelly stated he was pleased with the reports provided by State Street and mentioned the reports made the explanations provided by management clear.

4. Presentation, Discussion, and Appropriate Action Regarding Independent Reporting, Monitoring, and Oversight of the ASRS Investment Program – Includes Total Fund and Investment Performance Report Q4-13

Mr. Allan Martin, NEPC Partner, presented information on NEPC's reporting, monitoring, and oversight of the ASRS investment program. He stated the ASRS investment objectives including: 1) achieving a 20-year rolling annual total fund net rate of return equal to or greater than the actuarial assumed interest rate, 2) achieving one- and three-year rolling annual total fund net rates of return equal to or greater than the return of the ASRS SAAP benchmark, 3) achieving one- and three-year rolling annual net rates of return for ASRS strategic asset class benchmarks, and 4) ensuring sufficient monies are available to meet pension benefits, health insurance, and other cash flow requirements.

Mr. Martin also presented substantial information on the total fund attribution and asset class performance versus the benchmarks for those classes. He then presented the total fund risk statistics from 1-, 3-, 5- and 10-year returns in comparison to the peer universe.

5. Presentation, Discussion, and Appropriate Action Regarding the ASRS Private Markets 2014 Implementation/Pacing Plans

Mr. Polen and Mr. Eric Glass, Portfolio Manager of Private Markets, addressed the Committee with in depth information regarding the real estate and private equity pacing and implementation plans. Both Mr. Polen and Mr. Glass expanded on the pacing and implementation plans currently in use, and explained in detail which ways they help provide financial predictions for the future, plans for ongoing commitments, as well as direction and guidelines to the team so they may determine when to reduce and increase the level of investments throughout the year based on market conditions.

6. Presentation, Discussion, and Appropriate Action Regarding Utilization and Reporting of the Net Open-end Diversified Core Equity (ODCE) Benchmark

Mr. Micheal Copeland, Investment Analyst, addressed the Committee with information to clarify a discrepancy in benchmark data provided by Credit Suisse. Instead of using net benchmark for performance reporting, Credit Suisse mistakenly used gross numbers, causing the benchmark return at the asset class level to be overstated and the performance of the real estate class to be understated. Mr. Copeland noted, Credit Suisse has been instructed to fix the error using NFI-ODCE net as the benchmark from inception of the real estate program.

Mr. Connelly questioned if this type of error was grounds for an audit on the benchmarking program to ensure future errors of this type do not occur. Mr. Polen indicated the likelihood of this type of error occurring again is very unlikely, as the ASRS currently has an analytical system in place to ensure reports are being provided with correct data.

7. Presentation, Discussion, and Appropriate Action Regarding the Audit of the Investment Management Division (IMD) Trading System for both Equities and Bonds

Mr. Bernard Glick, Chief Internal Auditor, addressed the Committee to inform them of the IMD Investment Trading System audit. The audit being conducted is to ensure internal and external controls for internally run portfolios are in line with policies, laws, regulations, etc., and will be available by the next IC meeting on April 21, 2014.

8. Requests for Future Agenda Items

Mr. Tom Connelly requested a discussion regarding expectations and actions from IMD in the event of a volatile market or significant fall in U.S. equities, and suggested the discussion be addressed at the Board level.

Mr. Connelly stated the following and referred to Mr. Martin, "When reading the academic literature the standard now seems to be some multi-factored decomposition for manager returns." He mentioned it would be interesting to hold a discussion regarding the efficiency of multi-factored models and whether or not the consulting industry will be moving in that direction.

9. Call to the Public

No members of the public requested to speak.

10. Adjournment

The meeting adjourned at 4:53 p.m.

Respectfully submitted,

ARIZONA STATE RETIREMENT SYSTEM

Gloria Trujillo Date Investment Committee Administrator	Gary Dokes Date Chief Investment Officer

ARIZONA STATE RETIREMENT SYSTEM

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Paul Matson
Director

MEMORANDUM

TO: The Arizona State Retirement System (ASRS) Investment Committee (IC)

FROM: Mr. Paul Matson, Director
Mr. Gary Dokes, Chief Investment Officer (CIO)

DATE: April 7, 2014

RE: **Agenda Item #3:** Presentation and Roundtable Discussion Regarding the Federal Reserve Balance Sheet, its Management and Monetary Policy.

Purpose

Presentation and discussion regarding the balance sheet of the Federal Reserve, its management, and monetary policy

Recommendations

Informational only; no action required

Background

Throughout the year, the CIO with consultation with the IC Chair and Director, initiates an IC/IMD Investment forum which covers a topic of interest regarding the economy or financial markets. In general, the structure of the forum include participation by IC Trustees, Director, CIO, ASRS investment staff, ASRS Investment Consultant(s) and select external parties who are knowledgeable of and can share perspectives on the specific subject matter. It is intended that the discussion among forum participants will focus on fostering engagement rather than on specific investment decision-making.

This month's forum will focus on the Federal Reserve with specific interest in the following:

a. The Federal Reserve balance sheet's composition and the operational mechanics of its investment management.
b. The practical effects of expansion in the monetary base and the operational mechanics of tapering.
c. Perspectives on excess reserves held at the Fed and not available for bank lending (i.e., implications, etc.).

As way of background, since the financial crisis in 2008 the Federal Reserve has dramatically increased their balance sheet and led to an extraordinary amount of liquidity in global financial markets. This has allowed the U.S. to gradually recover from the worst recession since the Great Depression and has assisted in the deleveraging of U.S. households and corporate balance sheets. Though the economy has not normalized to pre-crisis levels, the Fed is attempting a delicate balance of transitioning from direct stimulus to "forward guidance" policy regarding the tapering of monetary policy. A number of headwinds may affect the efficiency of this transition including the zero bound limit of conventional monetary policy, potential for deflationary pressures, and a continued near zero percent in real wage growth.

The following parties will share their perspectives on this topic. Though each will reference material they provided, the discussion is intended to be interactive and allow for Q&A. The CIO and NEPC will moderate the panel with participation welcomed from IMD staff.

Panelist:

Mr. William Poole was a Governor of the Federal Reserve Bank of St. Louis and served as a voting member of the Federal Open Market Committee. Mr. Poole is Senior Fellow at the Cato Institute, Senior Advisor to Merk Investments and, as of fall 2008, became a Distinguished Scholar in Residence at the University of Delaware.

Mr. Michael Cembalest is the Chairman of Market and Investment Strategy for JPM Asset Management. His research primarily focuses on his market and economic views by region and analyses of specific investment topics (credit, hedge funds, private equity, municipals, active equity management, etc.)

Mr. Kurt Winkelmann has managed MSCI's Global Investment Strategies group which focuses on SAAP development and risk advisory services. Mr. Winklemann holds a PhD and MA in Economics from University of Minnesota.

Reference Materials:
Federal Reserve Policy | April 7, 2014 | Merk Investments | William Poole

Eye on the Market |Outlook 2014 | January 2014 | J.P. Morgan Asset Management

Materials for Kurt Winkelmann's presentation is anticipated to be available and disseminated prior to the meeting.

January 2014

William Poole

William Poole is Senior Fellow at the Cato Institute, Distinguished Scholar in Residence at the University of Delaware, Senior Advisor to Merk Investments and a Special Advisor to Market News International.

Poole retired as President and CEO of the Federal Reserve Bank of St. Louis in March 2008. In that position, which he held from March 1998, he served on the Federal Reserve's main monetary policy body, the Federal Open Market Committee. During his ten years at the St. Louis Fed, he presented over 150 speeches on a wide variety of economic and finance topics.

Before joining the St. Louis Fed, Poole was Herbert H. Goldberger Professor of Economics at Brown University. He served on the Brown faculty from 1974 to 1998 and the faculty of The Johns Hopkins University from 1963 to 1969. Between these two university positions, he was senior economist at the Board of Governors of the Federal Reserve System in Washington. He was a member of the Council of Economic Advisers in the first Reagan administration, from 1982 to 1985.

Poole received his AB degree from Swarthmore College in 1959, and MBA and Ph.D. degrees from the University of Chicago in 1963 and 1966, respectively. Swarthmore honored him with the Doctor of Laws degree in 1989. He was inducted into The Johns Hopkins Society of Scholars in 2005 and presented with the Adam Smith Award by the National Association for Business Economics in 2006. In 2007, the Global Interdependence Center presented him its Frederick Heldring Award.

Poole has engaged in a wide range of professional activities, including publishing numerous papers in professional journals. He has published two books, *Money and the Economy: A Monetarist View*, in 1978, and *Principles of Economics*, in 1991. In 1980-81, he was a visiting economist at the Reserve Bank of Australia and in 1991, Bank Mees and Hope Visiting Professor of Economics at Erasmus University in Rotterdam. At various times, he served on advisory boards of the Federal Reserve Banks of Boston and New York, and the Congressional Budget Office.

Poole appears frequently on the speaking circuit and is well known for his commentary on current economic and financial developments.

Poole was born and raised in Wilmington, Delaware. He has four sons.

MEMORANDUM

Date: 7 April 2014

To: Investment Committee, Arizona State Retirement System
From: William Poole,[1] Woodsedge Consulting LLC (gswpoole@sprintmail.com)
Subject: Conference Call, 21 April 2014

Introduction

My intent is to provide an outline of major macro policy issues, with emphasis on monetary policy, relevant for investors. The first section contains a very sketchy outline of major non-monetary issues. Although security markets seem at this time to be much more focused on monetary than fiscal policy matters, current economic performance is primarily a symptom of maladies in tax and regulatory policy that can be only partially offset, at best, by monetary policy. This point is a critical one, all too often neglected in policy discussions.

This memorandum should be read alongside the PowerPoint presentation, which is where the charts appear.

The Real Economy

By "real" I am referring to non-monetary/non-financial matters. A blanket statement should come first. Whenever an economy (national or regional) suffers slow growth and a level of output well below full potential for an extended period, the explanation is invariably that disincentives to economic activity are at work. Invariably? Well, almost. An important exception is that hyperinflation damages economic efficiency and hyperinflation is invariably a consequence of excessive money growth. Historically, excessive money growth has most often been a consequence of fiscal imbalance, where a government is printing money to pay its bills.

A couple of paragraphs is all I will offer to support this position. We learn much from observing extreme cases. North Korea. Cuba. The former Soviet Union. China before 1979. Argentina, which was among the top-ranked countries in per capita income a century ago but has been turned into a low-income, sometimes developing, economy by poor government. Monetary policy could not correct slow growth in these countries.

We observe similar examples within the United States. The Marcellus shale gas formation stretches across West Virginia, Ohio, Pennsylvania and New York. With the exception of New York, these states are all permitting drilling, spurred by the success of North Dakota in developing its shale resources. It is no accident that in February 2014 North Dakota had an unemployment rate of 2.6 percent, the lowest of any state, while Rhode Island had a rate of 9.0 percent, the highest of any state. North Dakota is supporting massive shale gas and oil development; Rhode Island has long had a poor business climate. (I should know—I lived there for a quarter century!)

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[1] Dr. Poole is Senior Fellow, Cato Institute, Distinguished Scholar in Residence, University of Delaware and Senior Advisor to Merk Investments and Special Advisor to Market News International. He retired as President and CEO of the Federal Reserve Bank of St. Louis in March 2008.

For a long-term perspective on the importance of governance and institutions on economic growth, I strongly recommend two books by the economic historian, Niall Ferguson. *Civilization: The West and the Rest* (2011) and *The Great Degeneration* (2013).

Slide 2 shows U.S. total non-farm employment monthly since 1947. ("FRED" is the St. Louis Federal Reserve web site for **F**ederal **R**eserve **E**conomic **D**ata.) The log scale makes it easy to see that employment, until this recovery, has always exceeded its pre-recession peak within a few quarters of the cycle trough. It is increasingly difficult to maintain the argument that the current slow recovery is a consequence of the financial crisis. The business contraction ended in June 2009, almost five years ago. The Fed reduced its policy rates to near zero in December 2008 and they remain there today. Businesses hold record amounts of cash and credit is readily available at banks and in the security markets to all credit-worthy borrowers. Economic growth this slow this long is a consequence of non-monetary conditions.

One argument is that there is a growing structural mismatch between the worker needs of employers and the skills in the labor force. Slide 3shows that the ratio of employment to population age 16 and over has declined from about 63 percent to about 58 percent (blue line). This decline cannot be attributed to the job market behavior of the young or the elderly. The baby-boom generation is reaching retirement age in large numbers but the labor-force participation rate (the percentage of those employed plus those unemployed looking for work) of those 55 and older is not declining (black line) and the *absolute* number of employed workers over age 55 is increasing (green line, scale at right). Indeed, the number of older workers employed actually increased during the contraction phase of the business cycle, from December 2007 to June 2009. If the skills mismatch hypothesis were materially important, we might have expected the number of older persons employed to have declined as it is usually thought that older workers have more difficulty in adapting to new technology and their shorter remaining working life makes them less attractive for retraining.

Many companies complain that they cannot find the skills they need in the labor market. We would be better off if workers had skills in demand but, despite the complaints, I have not heard of projects being cancelled for that reason. Nor do we see much wage pressure. My perception is that there is nothing new about the skills shortage and nothing new about employer complaints. In this regard, it is business as usual; companies are in fact finding the skills they need, or are creating them in their in-house training programs (as they long have).

There is a war of words between many conservatives and many liberals as to whether welfare state disincentives to work explain the decline in employment for prime age workers—those aged 25 to 54. Slide 4 provides a crude but adequate diagram for addressing this controversy. The United States is a naturally growing economy, because of population increase, rising productivity and recovery from the recession. Output (supply) potential is rising but aggregate demand is not keeping up. As a consequence, GDP growth is slower than it should be and inflation is tending to fall or remain about constant. In any event, signs of inflation pressure are absent. It probably is true that work disincentives are growing, but that is not the primary reason the recovery is slow. Slow growth accompanied by little inflation pressure indicates that the slow growth is primarily a reflection of slow growth of aggregate demand rather than supply constraints.

Why is aggregate demand growing slowly? Keynesians argue that caution remaining from the financial crisis is important. More recently, some have suggested that the U.S. economy is falling into "secular stagnation." That is a condition—an idea left over from the 1930s—in which private investment is simply not adequate to bring the economy to full employment.

The critical issue is indeed inadequate private investment. Slide 5 shows that we have never since World War II seen such a slow recovery in investment, despite record low interest rates and a plentiful supply of capital in bank and security markets. Business investment is just barely back to its level at the cycle peak at end of 2007.

I am convinced that the reason for the slow recovery of investment is uncertainty over fiscal and regulatory policy. Everyone knows that governments at all levels are struggling with deficits. At the federal level, defense suppliers, for example, are uncertain about future procurement contracts, which reduces their incentive to invest. There is conflict over tax policy. That means that future after-tax returns to entrepreneurs are uncertain. This observation may seem inconsistent with recent performance of the equity markets. To reconcile the observations, it appears that profits from the existing capital stock are rising for a variety of reasons, one of which is that the constraints on labor compensation from weak labor markets are boosting the profits share of GDP. High profits on existing capital do not necessarily imply that firms should expect high profits from new investment.

It is also clear that regulatory constraints have slowed or stopped much development. I have spent some time digging into the permitting process controlled by the Federal Energy Regulatory Commission. President Obama has held up the Keystone XL pipeline but FERC has held up many projects under its jurisdiction. These are precisely the capital-intensive projects that ought to be stimulated by low interest rates. The United States is simply not pursuing many feasible and profitable investment opportunities because government is not granting necessary permits. [2]

Although supply constraints are of little importance today, they will gain significance as the economy approaches full employment. Disincentives to labor-market participation have been accumulating. For those interested in this topic, I recommend a recent study by Michael Tanner and Charles Hughes, "The Work Versus Welfare Trade-off: 2013." (Available on the Cato Institute web site.) Here are several key findings:

> "… welfare currently pays more than a minimum wage job in 35 states …"

> "In 11 states, welfare pays more than the average pre-tax first year wage for a teacher."

> "In 39 states it pays more than the starting wage for a secretary."

Over time, these disincentives are likely to grow and will limit labor-force participation. The U.S. economy will not return to the high ratio of employment to population observed before the crisis with these disincentives to work. We may well observe attempts to increase employment through expansionary monetary and fiscal policies, but such efforts will be futile without reforms to change labor-market incentives. Given the Federal Reserve's emphasis on higher employment, there is a real danger that the Fed will overstay monetary ease. Monetary policy cannot fix the welfare system.

In this section, I have left mention of the Affordable Care Act to last. We do not yet know the full implications of this legislation for the cost of health care, for labor-market participation, for the politics of upcoming elections and so forth. Whatever these effects may be, the effects on the data and their interpretation will puzzle economists and business analysts for many years.

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[2] I discussed this issue in a recent Forbes Op-Ed column: http://www.forbes.com/sites/realspin/2014/02/20/the-federal-governments-permitting-process-has-hamstrung-economic-growth/

Investment policy implications. The Federal Reserve is unable to address the non-monetary constraints on business investment. The Fed cannot, for example, grant the building permits for Keystone XL nor can it enact tax reform to lower marginal rates and increase the security of returns to entrepreneurs. However, changes in control of Congress and the White House could unleash a torrent of investment. Companies have the cash and commercial banks have the reserves to expand credit quickly and massively.

The Federal Reserve's large and expert staff will be ahead of the market in assessing implications of the Affordable Care Act on labor markets and the data. However, the Fed will feel constrained in sharing this information, as it will often be politically controversial and even explosive. Investors should pay close attention to Fed evaluations, as information will leak out indirectly as members of the FOMC present speeches presenting their own evaluations. These may often not be strictly their "own" but derived from the work of the large, expert staff at the Board of Governors and insights from business contacts.

Federal Reserve Policy

Janet Yellen faces four major challenges. One is to communicate clearly with the markets, Congress and the public. A second is to manage the FOMC's transition to a traditional policy of setting and achieving a target for the federal funds rate. A third is to wind down the Fed's portfolio to, perhaps, $1.5 trillion. A fourth is to exert control over the FOMC. All are related.

I am reminded of the old saw about the driver lost on back roads in Vermont. He stops to ask driving directions from a farmer setting taps in the maple trees for the traditional spring production of maple syrup. The farmer scratches his beard and replies, "Don't know—I would not start from here." With regard to monetary policy, I would not start from here either, but we are where we are.

The Fed's Communications Challenge in Managing the Transition

Part way through the Q&A part of her recent press conference, Janet Yellen suggested that the beginning of interest rate increases might be a "considerable period" beyond the end of the asset purchase program, and that a considerable period might be about 6 months long. That would put the beginning of rate increases in the spring or early summer of next year, somewhat before the market had been anticipating that watershed event.

On that comment, as has been well discussed, the 10-year U.S. Treasury bond rate snapped upward by about 10 basis points and the S&P 500 index down by about 1 percent. Observers speculated through the end of the day about whether the "six-months" comment was a rookie's mistake or a subconscious Fed signal. I thought most likely a mistake, given Yellen's repeated insistence that Fed policy would be data dependent. She said, after all, that the asset purchase program itself would not be on a "preset" course. By now, it appears that the market verdict is that her comment was unintended—a simple mistake that anyone could make under such circumstances. Nevertheless, the Fed chair should not make such a mistake.

The market reaction to her words suggests once again that an important effect—perhaps the principal one—of the Fed's asset purchase program has been a signaling device for when the FOMC will begin to increase policy rates. Chairman Bernanke provided an unintended signal in May 2013 when he began to discuss a reduction in Fed asset accumulation, the so-called "taper." The 10-year T bond rate surged upward by almost 100 basis points over subsequent weeks.

Bernanke and other FOMC members hastened to explain that the taper would not be a signal of forthcoming interest rate increases.

In the past, the FOMC has gotten itself tangled up in its words, and exiting from policy statement language without sending unintended signals has been a challenge. Now, the Committee has to exit not only from words in a prior statement but also from a bloated $4 trillion portfolio. How might it proceed?

To begin, Yellen should treat the news conference as a no-news conference. This forum is not the right one to present anything new. Indeed, my recommendation would be that she should only deliver serious news in a speech, or the Q&A that follows, when U.S. markets are closed. Traders are always on a hair-trigger, and automated trading systems are now looking for key words. An attempt to present an argument of any complexity when the U.S. markets are open is fraught with peril. Yellen's words can trigger a market reaction even before her sentence is complete, much less a paragraph is complete. This advice is so obvious that investors should not expect genuine news to come out of any of Yellen's future press conferences.

Despite the Fed's constant emphasis on the importance of good communication, it is going down the wrong road and needs to turn around. The most recent FOMC policy statement is almost 900 words long. It contains multiple traps for the future.

Here is one trap: "The Committee recognizes that inflation persistently below its 2 percent objective could pose risks to economic performance, and it is monitoring inflation developments carefully for evidence that inflation will move back toward its objective over the medium term."

Suppose inflation does rise to about 2 percent year over year, which it most certainly will at some point. My guess is that when facts demand that the sentence just quoted come out, there will be sustained debate within the Committee as to how to remove it without implying that a rate increase may be at hand. The FOMC has a general statement about its 2 percent inflation target, updated this past January, and of course it is "monitoring inflation developments carefully," just as it does all developments. Moreover, the Committee already has a simple factual sentence about inflation in the first paragraph of its policy statement. "Inflation has been running below the Committee's longer-run objective, but longer-term inflation expectations have remained stable." When the facts change, the Committee can change that simple statement without necessarily implying anything about future policy that the market does not already know.

In recent years, the FOMC has argued that "forward guidance" about future monetary policy is an important policy tool. My conviction is that forward guidance has been and will continue to be problematic, although it seems that the Committee is convinced that forward guidance should help to achieve policy objectives. Since the 2008-09 crisis, the policy environment has been asymmetric; guidance has been that policy rates will remain near zero and for longer than the market might be guessing. That situation is bound to change and is why the market responded as it did to Yellen's "six months" comment in the press conference.

The FOMC employs two forms of forward guidance. One is the balance of risks sentence that appears in each policy statement and the second is the dot diagram released once per quarter with the economic projections and the Chair's press conference. Consider the balance of risks sentence first. In the policy statement released at the end of FOMC meeting last month, the relevant sentence reads, "The Committee sees the risks to the outlook for the economy and the labor market as nearly balanced." It is worth understanding the history of the balance-of-risks language.

Before 1994, the FOMC did not issue a policy statement at the conclusion of a meeting. Instead, the Committee issued the "Record of Policy Actions" for a meeting *after* its next meeting. Policy language sometimes included a sentence like this: "... somewhat greater reserve restraint would, or slightly lesser reserve restraint might, be acceptable in the intermeeting period." (Record of Policy Actions, 28 March 1989, p.14) This was the so-called "tilt" language that in this example greater restraint *would* and lesser restraint *might*. Because the statement was not released until after the next meeting, this language had no direct bearing on market expectations about the current policy stance. The device served as a mechanism by which the Chairman—Greenspan in this example—might be able to entice a reluctant member wanting a firmer or easier policy not to dissent. The practice began during the Volcker years.

Later, once the FOMC began to release its policy statement at the conclusion of a meeting, the tilt language had a direct influence, or possible influence, on market expectations about the direction of a future policy adjustment, and perhaps one in the very near future. With accelerated release of the policy statement, observed effects of the tilt language on interest rates did not seem helpful. Greenspan appointed a committee, chaired by Roger Ferguson, to examine alternatives. That Committee came up with the balance-of-risks verbiage to replace the tilt language. (See Robert H. Rasche and Daniel L. Thornton, "The FOMC's Balance-of-Risks Statement and Market Expectations of Policy Actions," The Federal Reserve Bank of St. Louis *Review*, September/October 2002, pp. 37-50.)

My view has long been that forward guidance, in the balance-of-risks form or any other, is problematic. This practice creates a host of communication issues. In coming years, the Committee will have to deal with a symmetric situation, in which it might increase or decrease its federal funds rate target. It may have to deal with pauses in ongoing increases, and when to resume increases. Will it want to signal a rate increase or decrease by changing the balance-of-risks language? More immediately, once the Committee starts to increase rates, perhaps later this year or next, will it want to signal that it intends to increase the rate again at its next meeting? How will the Committee indicate that it is ready to pause in rate increases? If the FOMC uses language that seems to provide clear forward guidance, will it feel bound to follow that guidance? Will the market feel that the Committee has not been very transparent if it changes its fed funds rate target without signaling its intention at the prior meeting?

For an illustration of the problem the FOMC has had in addressing such questions, here is Janet Yellen speaking in the FOMC meeting in June 2006:

> "So although on purely economic grounds I'd prefer to pause at this meeting, I certainly recognize that it would be difficult to leave the stance of policy unchanged at this time. In general, I believe that we should do the right thing, even if it surprises markets, but in this case our public statements seem to have convinced the public that we will raise the funds rate today. If we didn't follow through, there would likely be some loss of credibility for policy. Moreover, as I've indicated, I see today's call as an exceptionally close one between firming and pausing. Therefore, I can certainly support another increase in the funds rate of 25 basis points today." (FOMC transcript, Meeting of 29 June 2006, p.105.)

At the June 2006 FOMC meeting, the policy discussion runs for 43 pages, starting at page 96 of the transcript. All but one of the participants favored increasing the funds rate by 25 basis points. In the transcript, there is relatively little discussion about that increase and page after page of discussion of the statement language. In the end, the statement contained this passage: "Although the moderation in the growth of aggregate demand should help to limit inflation pressures over time, the Committee judges that some inflation risks remain. The extent and timing of any additional firming that may be needed to address these risks will depend on the evolution of the outlook for both inflation and economic growth, as implied by incoming information."

Despite this apparent forward guidance, at its next meeting, in August, the Committee held the funds rate at 5¼% after increasing the rate 17 times without interruption at prior meetings. This particular example is not an isolated one. What should the FOMC learn from its experience with forward guidance over many years?

Forward guidance does not work well because economic projections are not very accurate. Fed staff routinely provides the FOMC with measures of forecast accuracy in its briefing material, the Greenbook Part I. Unfortunately, when out on the speaking circuit, Fed officials then and now rarely refer explicitly to these errors. To use the example from June 2006, the staff point forecast for growth in real GDP, fourth quarter over fourth the prior year, was 3.3 percent growth for 2006 and 2.7 for 2007. The staff also reported that based on *actual* Greenbook forecast errors 1986-2004 the 70 percent confidence range for these two point forecasts was 2.1-4.5 for 2006 and 1.1-4.3 for 2007. The 70 percent confidence intervals for the unemployment rate in the fourth quarter of the year were 4.6-5.2 and 4.4-6.0 for 2006 and 2007, respectively. For core inflation, the confidence intervals were 1.9-2.8 and 1.4-3.0 for 2006 and 2007, respectively. The Committee now releases a table of confidence intervals with its quarterly projections, most recently in the Minutes for its meeting in December 2013. (See slide 6.)

Keep in mind that 30 percent of the forecast errors could be expected to be *outside* these ranges. Moreover, historically the forecast sometimes changes quite rapidly as new information arrives or unanticipated shocks hit the economy. The FOMC's emphasis today on forward guidance is entirely misplaced. The 43 pages of transcript devoted to agonizing over statement language in the June 2006 FOMC transcript is not an exception. In my memory, almost every FOMC meeting was like that. And, I have yet to mention that before each FOMC meeting an enormous amount of staff time went into crafting statement options, and sometimes FOMC members exchanged multiple memos on statement language.

This effort would have been much better spent thinking through appropriate responses to various possible scenarios as to how the economy might evolve. Put another way, the FOMC needs to concentrate on its policy *strategy* going forward, not its words. Public communication should emphasize that the essential element of policy is development of strategies to cope with inherent uncertainty.

Standard FOMC practice is now to release a summary of participants' economic projections quarterly. The tables show the range of point projections. For example, in the central tendency projections just released the unemployment rate point forecasts in the fourth quarter are shown as 6.1 to 6.3 for 2014, 5.6 to 5.9 for 2015 and 5.2 to 5.6 for 2016. These ranges are relatively narrow but completely misleading representations of forecast uncertainty. Each participant's point forecast has a range of uncertainty attached. If we apply the confidence intervals released with the Minutes of the December 2013 meeting, the 70 percent interval for 2014 should be about 5.4 to 7.0, for 2015 about 4.2 to 7.3. The interval for 2016 would be larger, about 3.4 to 7.4. These ranges are so wide that they provide little useful information to the market.

The FOMC rightly says that policy settings must be data dependent. That means that the "dot chart" (Figure 2 in the projections[3]) conveys little genuine information about future policy. The 2014 dots are all at the current fed funds target of 25 basis points except for one at 100 basis points. On the surface, that would seem to imply that the market should have great confidence that the Fed will not begin to adjust its fed funds rate target until 2015. That view is wrong because the economy *could* evolve toward much higher growth and/or higher inflation. Materially higher growth or inflation is not the present *point* forecast but experience with forecast errors makes clear that it could happen. Moreover, experience with forecast errors makes clear that the probability of "could" is not tiny.

The most succinct way to put the matter is that monetary policy a year in the future, or even six months out, is primarily determined by unforecastable future events and not by information at hand at the outset. Consequently, the FOMC needs to do two things. First, it needs to simplify its policy statement so that it can concentrate its effort on policy strategy of how best to react to various possible future scenarios. The internal debate over policy words is largely a waste of time. Second, the Committee needs to explain, over and over, the true scope of forecast uncertainty. The evolution of the fed funds rate target will depend on how the economy evolves.

Yellen should emphasize that policy adjustments will be as smooth and orderly as possible. To me, there is an upside and no downside to saying that the Committee intends to act at regularly scheduled meetings, and not between meetings, and that it expects that rate changes will come 25 basis points at a time. Of course, there may be exceptions requiring fed funds rate changes between regular meeting and in larger steps than 25 basis points. Stating the default option would make the internal FOMC process more orderly, would assist the market and would increase Yellen's stature as a leader.

The Committee provides implicit forward guidance as to future policy, as defined by its target for the federal funds rate, through the balance-of-risks sentence and its statements about the likely course of the economy. The dot diagram showing expectations for the federal funds rate itself makes the policy guidance explicit. This approach to forward guidance is extremely misleading because it is silent on how the FOMC might adjust its fed funds rate target should the economy evolve in directions not indicated by the point projections. Fed policy has been and will continue to be driven by unexpected changes in the economic picture.

Investment policy implications. If the economy continues its plodding growth, long-term interest rates will remain relatively low. Safe-haven flights to quality occasioned by troubles abroad could take rates lower. The Federal Reserve has provided essentially no guidance as to how it may react to various possible future scenarios. With unexpected news, the markets will be highly uncertain as to Fed responses.

The environment remains asymmetric. A weaker economy than the Fed's point forecast will simply mean that the period of unusually low interest rates will continue for longer than now expected. Conversely, stronger economic growth than the Fed now projects could yield a bond-market bloodbath. Bond-price declines would be exacerbated by questions, should they arise, about Janet Yellen's leadership. She has not been tested by fire, but at some point surely will be.

Winding Down QE

The Fed's portfolio policy—its quantitative easing—is entwined with market expectations about the course of interest rates, and especially the FOMC's strategy in

[3] The dot diagram is part of Figure 2, which is included in the Economic Projections of FOMC participants released quarterly at the end of an FOMC meeting.

normalizing policy around its traditional federal funds rate instrument. Changes in its portfolio policy will send signals, whether intended or not, about fed funds rate policy and more generally about the likely path for longer-term rates. The FOMC may well be tempted to change its portfolio policy to send a signal of some sort, but what sort? Having sent a signal, how will the Committee exit from that signal?

The FOMC will have to face the issue very soon. It is now reducing its asset purchases—the so-called “taper”—by $10 billion per month. Yellen says that the asset purchases are not on a preset course, but in an important sense they are. Having announced a reduction of asset purchases of $10 billion at its December 2013 meeting, and another $10 billion at its January 2014 meeting and yet another $10 billion at its March meeting last week, the FOMC has created a presumption of further reductions of like magnitude at forthcoming meetings.

To understand the issue here, suppose the Committee at its next meeting, in April, were to stop tapering and hold asset purchases at the current rate of $55 billion per month. What signal would that send? Almost certainly, the market would judge that the first increase in the fed funds target would be later than currently expected. And, the market would presume that the Fed sees a slower economic recovery than it saw at the time of the March meeting. Moreover, in the weeks that followed the market would engage in a guessing game as to how the Fed might react to incoming data, and whether its judgment suspending the taper made good sense.

The resulting uncertainty and upset in expectations about the Fed’s plans would not be constructive. What the FOMC ought to do is to say that progress in reducing its portfolio growth is proceeding smoothly and given that progress it wants to assure the market that a change in the current tapering schedule faces a high bar. That position could be reinforced by a Fed statement to the effect that should material information arrive suggesting that the economy’s growth is slowing the policy response will be to make clear that the first increase in the fed funds rate target will come later than had been earlier planned but that it does not intend to change the rate of tapering.

The FOMC should also make clear soon its portfolio plans once asset purchases have gone to zero. Waiting will only further entangle the portfolio policy with unhelpful implicit announcement effects concerning interest rate policy. The longer the Committee waits to settle its portfolio policy, the greater the announcement effects will be. Moreover, no matter what policy statement words may say, the announcement effects will be there because the timing will be judged against the backdrop of contemporaneous economic developments. There will never be a better time to settle portfolio policy than now, or very soon.

Having outlined the case for disposing of the portfolio policy issue, is that what I expect the FOMC to do? Probably not. Yellen will most likely keep all options open, thus ensuring a year or more of uncertainty over the matter.

Once the taper is complete, the policy issue will be whether to roll over maturing issues or whether to let the portfolio—which will be about $4.5 trillion— run off by not reinvesting interest and maturing principal. Depending on how rapidly the Fed reduces its portfolio, a full return to the traditional policy with most commercial bank holdings of reserves being required—most are excess today—will mean a Fed portfolio of about $1.5 trillion. Fed holdings of Treasuries with maturities over 5 years are today about that amount. Thus, if the Fed simply allows its portfolio to run off, the job will be almost complete in 5 years, depending on how rapidly its holdings of MBSs run off.

Although the Fed reports its MBS portfolio as including $1.6 trillion of bonds with maturities over 10 years, in fact MBSs tend to run off more rapidly than that figure might suggest. The 30-year mortgage behind MBSs is fully amortized, which means that the homeowner is paying down principal, and many mortgages are retired early when homeowners move to new homes. My judgment is that the Fed's portfolio unwind is manageable provided that the Fed sets clear expectations and sticks with its plan.

Investment policy implications. The Fed should put its wind-down portfolio policy on autopilot to prevent market confusion about its interest-rate intentions. However, I doubt that it will, and the market will have to continue to attempt to decipher what message the Fed is sending about future interest rates. The Fed's huge portfolio and bank's huge holdings of excess reserves create an inflation risk for the longer run. Failure of the Fed to wind down its portfolio during today's present relatively benign environment increases future risks. I fear that Janet Yellen is not sufficiently attentive to these risks.

Controlling/Leading the FOMC

My experience is that no committee can manage anything, and the FOMC is no exception. The chairman has to run the show; other committee members are advisors. Of course, that is not what the Federal Reserve Act says and other committee members have votes. Janet Yellen can count on winning the votes because the other members of the Board of Governors rarely vote against the chairman. Nor does the president of the Federal Reserve Bank of New York. Nevertheless, three or four dissenting reserve bank presidents, if all on one side, will be a problem for Yellen. She will have to be persuasive, perhaps in difficult circumstances.

She also must deal with the misleading dot diagram that displays the guesses FOMC participants make concerning the likely course of the federal funds rate. The diagram released with the policy statement for the meeting just concluded shows that three participants believe that appropriate policy will require a fed funds target of 2 percent or more by the end of 2015. Consider a scenario in which data between now and a future FOMC meeting (in September 2014, say) lead many participants to revise up by 50 basis points their estimates of the appropriate funds rate target by the end of 2014 and by 150 basis points by the end of 2015. Suppose also that Yellen believes that policy should not tighten so quickly and by so much. What then?

Yellen might have clear voting control over the FOMC but it would not be a healthy situation for so much opposition to be displayed so clearly in the dot diagram. Moreover, the opposition might be extremely tentative. Keep in mind that the dot exercise is a point forecast and the FOMC participants all understand that the standard errors are large. No one should feel much confidence about his/her guess as to the appropriate fed funds rate target at the end of 2015. The problem is that the exercise is itself flawed.

Could Yellen simply eliminate this part of FOMC "transparency?" Probably not. The Vermont farmer is right—we should not start from here. But here we are. What I think she ought to do is to alter the exercise by requiring that participants attach a range to their point estimates of the appropriate fed funds rate target. If I were still involved, my best guess for the appropriate funds rate target at the end of 2015 would be 1.5 percent but that would be the center of a range running from 0.25 to 4.0 percent. Moreover, I would not bet my house against this range—I can easily imagine a scenario in which the appropriate funds rate might end up at 5 percent. Thus, the blue dots in this figure could be supplemented with red dots showing the confidence range assigned by each FOMC member.

With the red dots, which would display what we reasonably know about monetary policy uncertainty, the dot diagram would become virtually meaningless. The purpose would not be deliberate obfuscation but an honest statement about policy uncertainty.

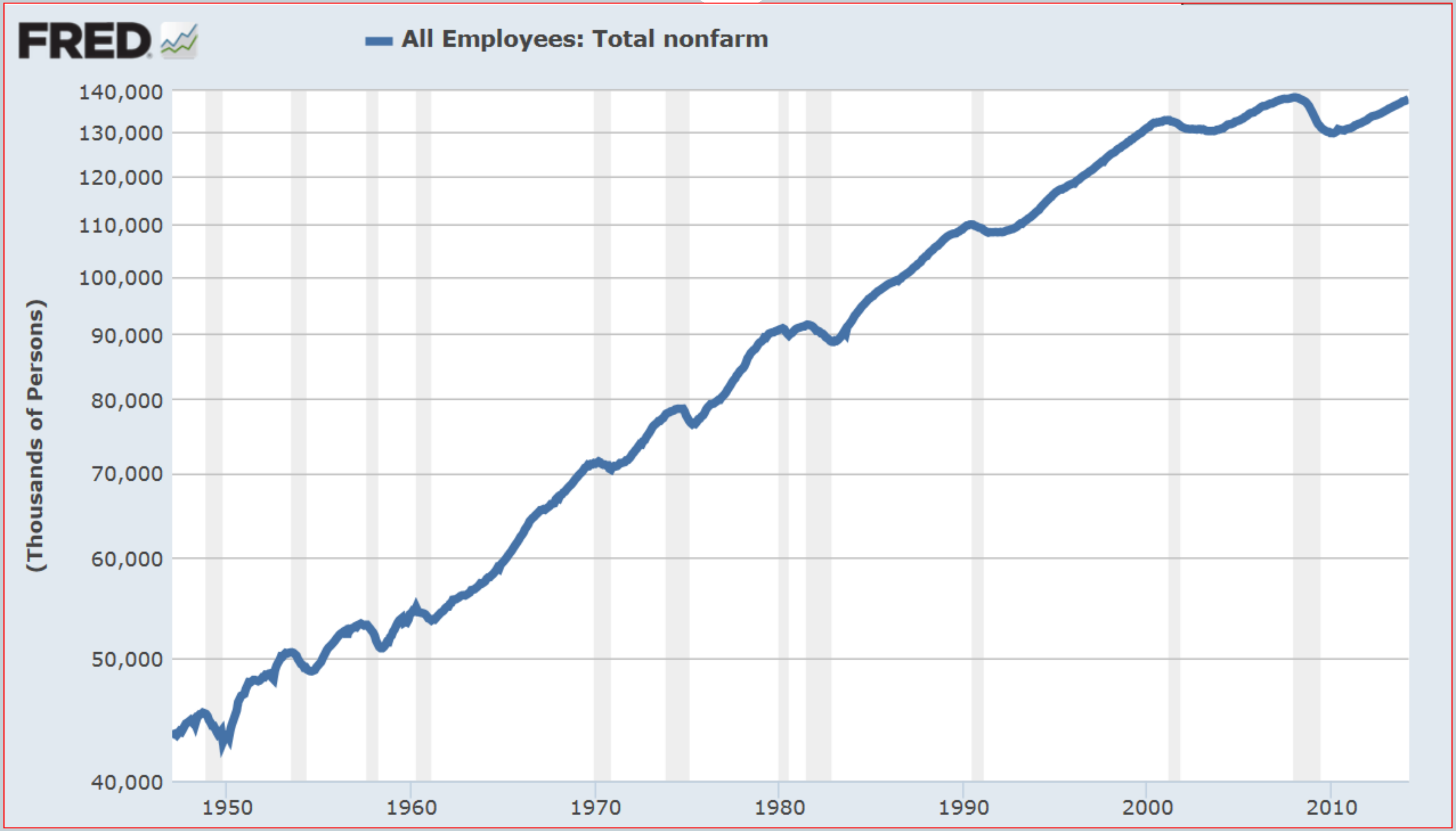
We have interesting times ahead. I wish Janet Yellen well, because we all need an effective Federal Reserve.

Federal Reserve Policy

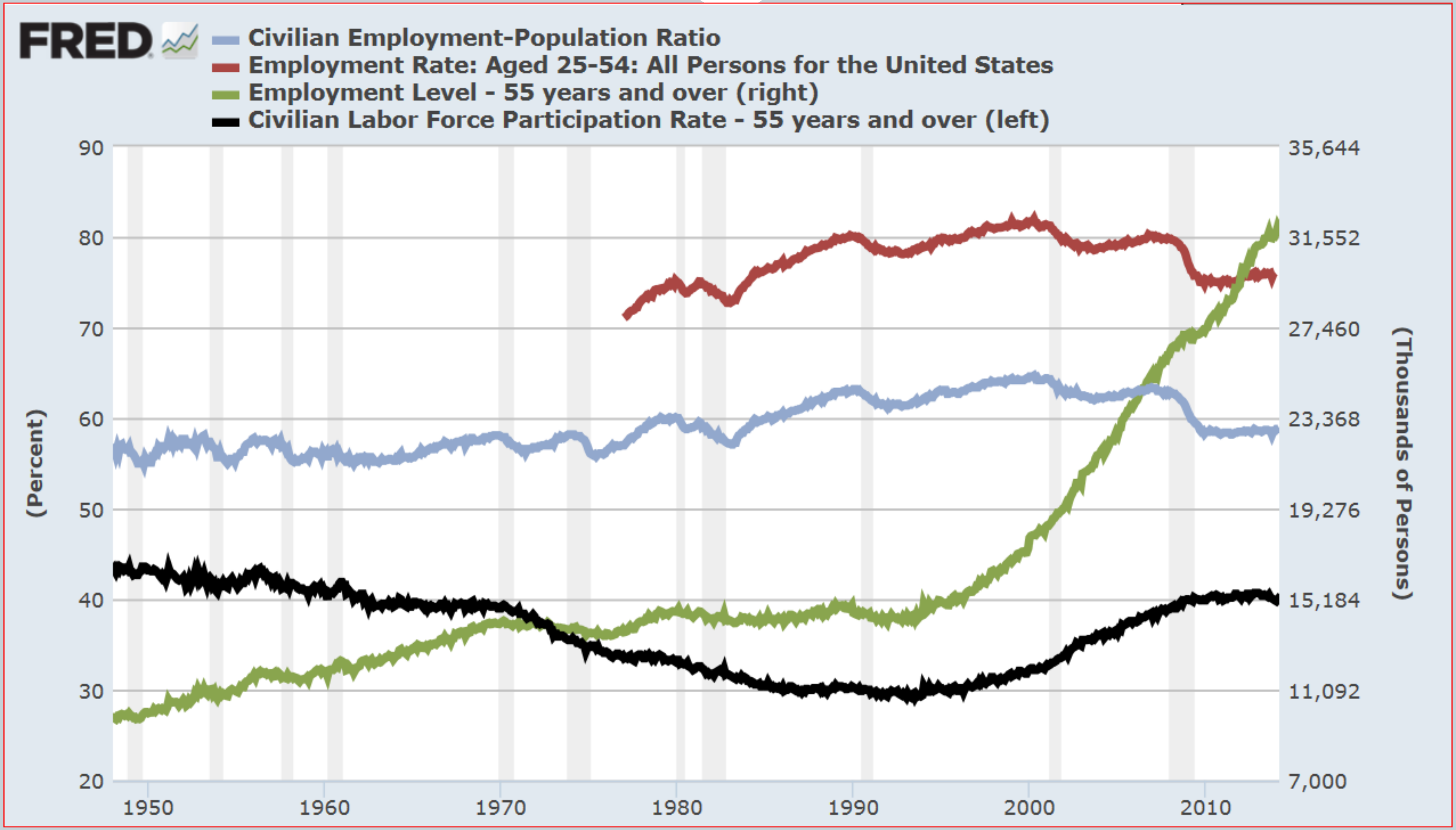
WILLIAM POOLE

7 APRIL 2014

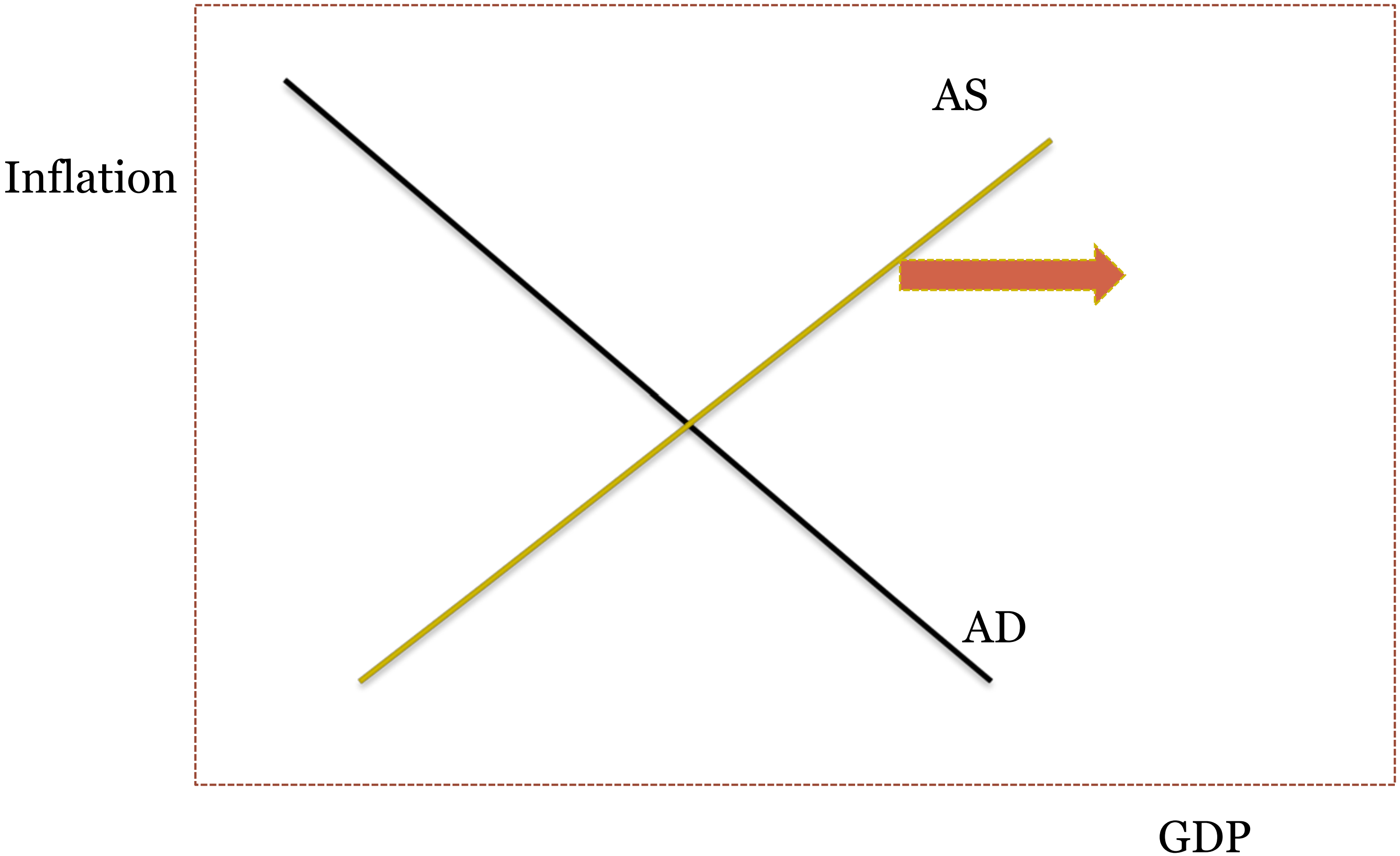
Weakest Economic Recovery Since WW II



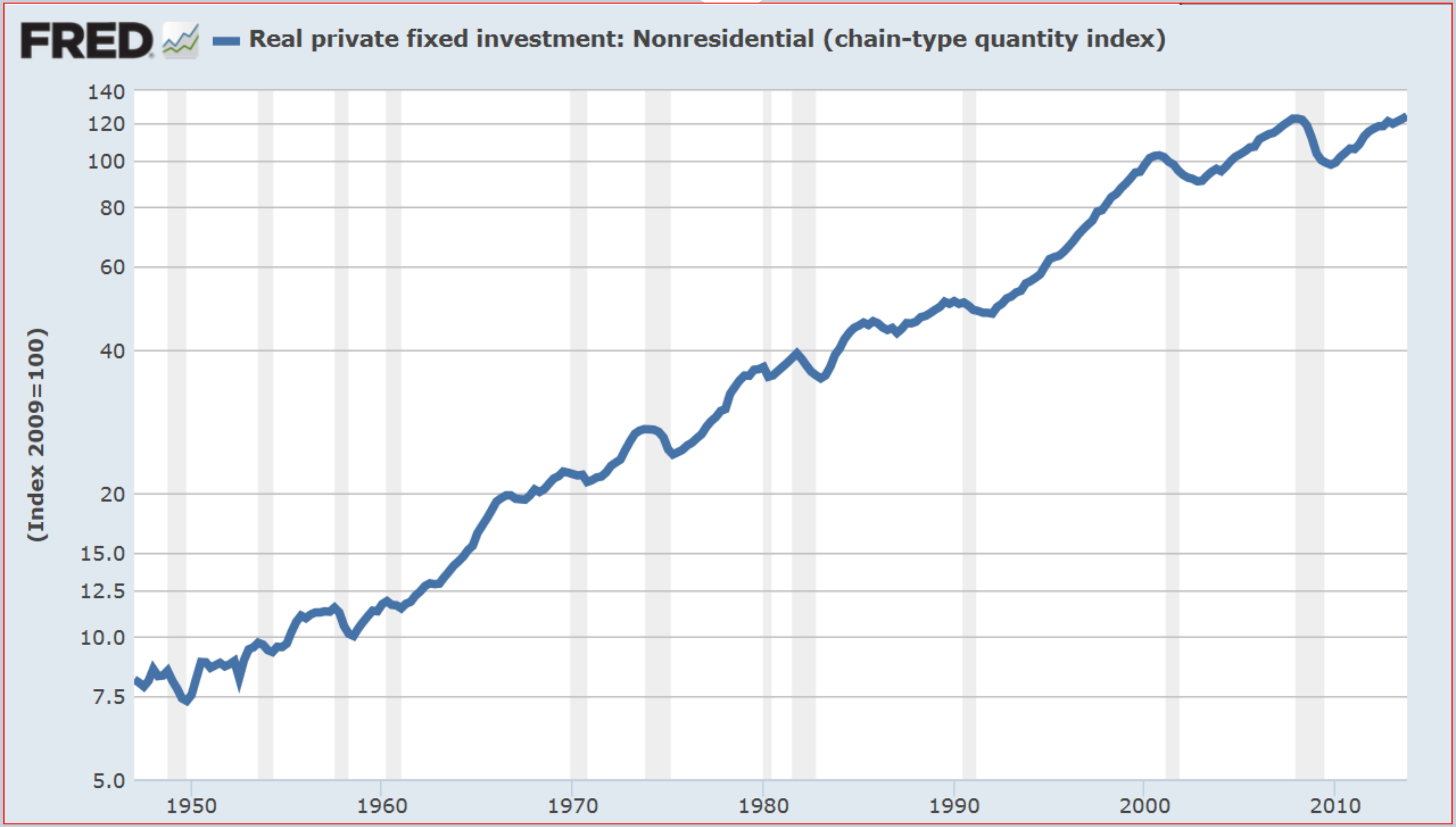
Employment Characteristics



Aggregate Supply and Demand



Nonresidential Fixed Investment



FOMC Projections Uncertainty, Dec 2013
(From Minutes of Mtg 17-18 Dec. 2013)

Table 2. Average historical projection error ranges
Percentage points

Variable	2013	2014	2015	2016
Change in real GDP[1]	±0.5	±1.4	±1.8	±1.8
Unemployment rate[1]	±0.1	±0.7	±1.4	±1.8
Total consumer prices[2]	±0.3	±0.9	±1.0	±1.0

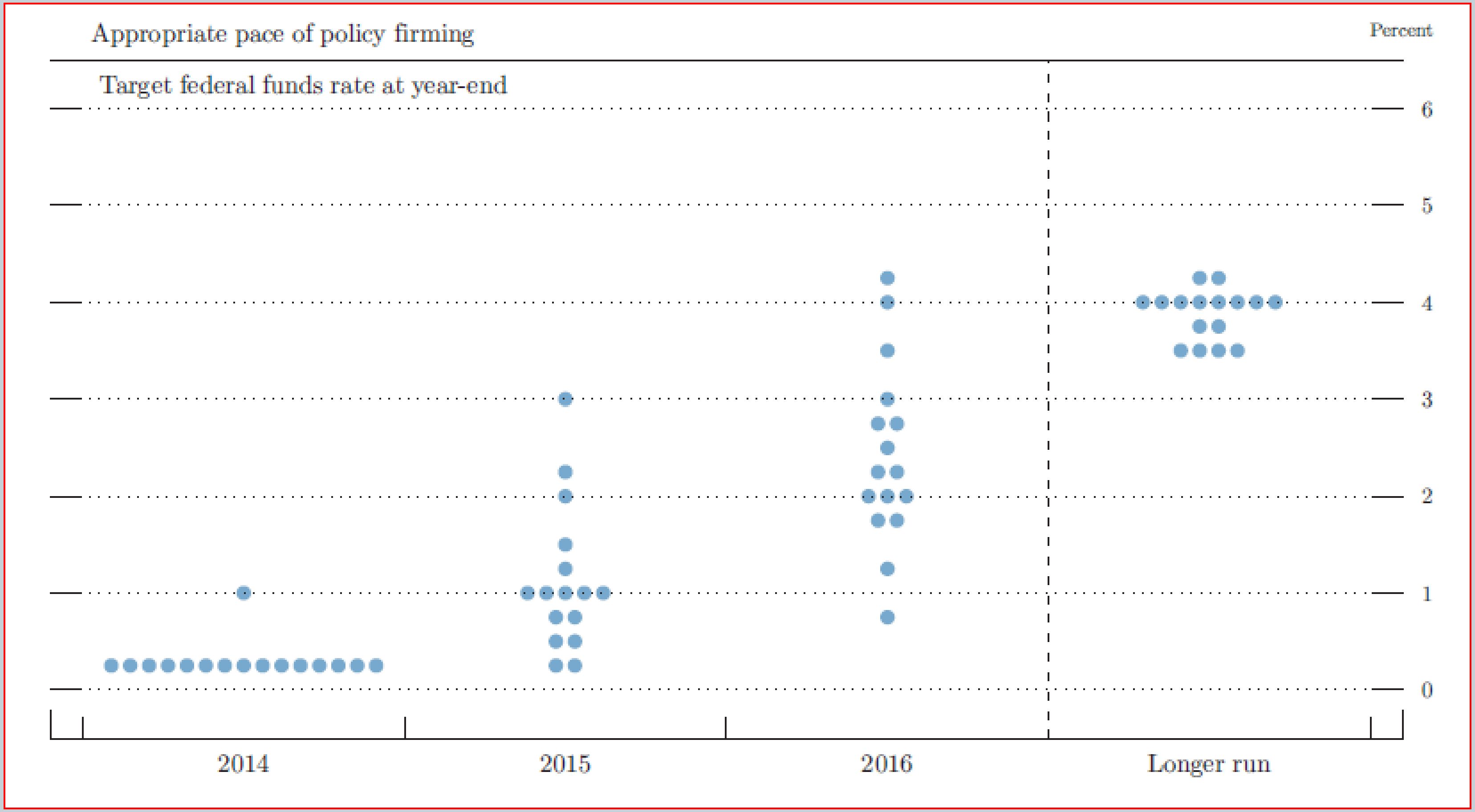
Implications of Projections Uncertainty

- Footnote to Table 2 above explains that outcome expected to be within the +/- range 70 percent of the time.
- March 2014 projections for end of 2014: central tendency of FOMC participants for unemployment rate were 6.1 to 6.3 percent.
- The projection better expressed as 6.2 +/- 0.5 percent or 5.7 – 6.7 percent.
- Moreover, probability 0.15 that U < 5.7 and probability 0.15 that U > 6.7.

Monetary Policy Implications

- Markets will react, because Fed will react, if economy comes in materially above or below point forecast.
- Fed "forward guidance" w.r.t. future Fed policy setting pays too little attention to implications of projections errors.
- The FOMC's dot diagram attracts great attention when released as part of projections materials.
- See next slide for the dot diagram released just before Yellen press conference last month.

The FOMC's Dot Diagram



Dot Diagram Interpretation

- All but one FOMC participant anticipated that the target federal funds rate would still be at 0.25 percent at the end of 2014.
- That is the best guess ***given*** that the economy performs as indicated by the central tendency of the economic projections.
- The fed funds rate projection ought to have a range of uncertainty attached to it.

Question for Janet Yellen

- At the March press conference, an astute journalist should have asked this question:
- "Chair Yellen, in the material the FOMC distributes routinely with the minutes—for the meeting this past December, for example—a table shows experience with errors in economic projections. Suppose that by this summer it appears that the economy is one standard error stronger than current point projections. That would increase the 2014 projection for GDP growth to about 3.5 % and the unemployment rate in the fourth quarter to about 5.5 %.

Question, continued.

- "A projection error of this size would not be particularly large. Assuming that the Committee also revised up its economic projections for 2015 and 2016, how would these revisions likely affect the projections for the federal funds rate in the fourth quarter of this year?"
- **This question and the Fed's likely answer are of critical importance to the markets.**

MICHAEL CEMBALEST

Chairman of Market and Investment Strategy J.P. Morgan Asset Management

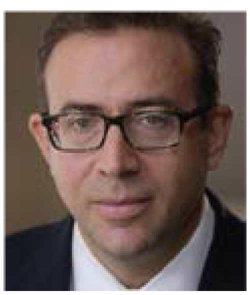
Michael Cembalest is Chairman of Market and Investment Strategy for J.P. Morgan Asset Management, a global leader in investment management and private banking, with $1.6 trillion of client assets under management worldwide (as of December 31, 2013). He is responsible for leading the strategic market and investment insights across the firm's Institutional, Funds and Private Banking businesses.

Mr. Cembalest is also a member of the J.P. Morgan Asset Management Investment Committee and a member of the Investment Committee for the J.P. Morgan Retirement Plan for the firm's more than 250,000 employees.

Mr. Cembalest was most recently Chief Investment Officer for the firm's Global Private Bank, a role he held for eight years. He was previously head of a fixed income division of Investment Management, with responsibility for high grade, high yield, emerging markets and municipal bonds.

Before joining Asset Management, Mr. Cembalest served as head strategist for Emerging Markets Fixed Income at J.P. Morgan Securities. Mr. Cembalest joined J.P. Morgan in 1987 as a member of the firm's Corporate Finance division.

Mr. Cembalest earned an M.A. from the Columbia School of International and Public Affairs in 1986 and a B.A. from Tufts University in 1984.



April 21st, 2014

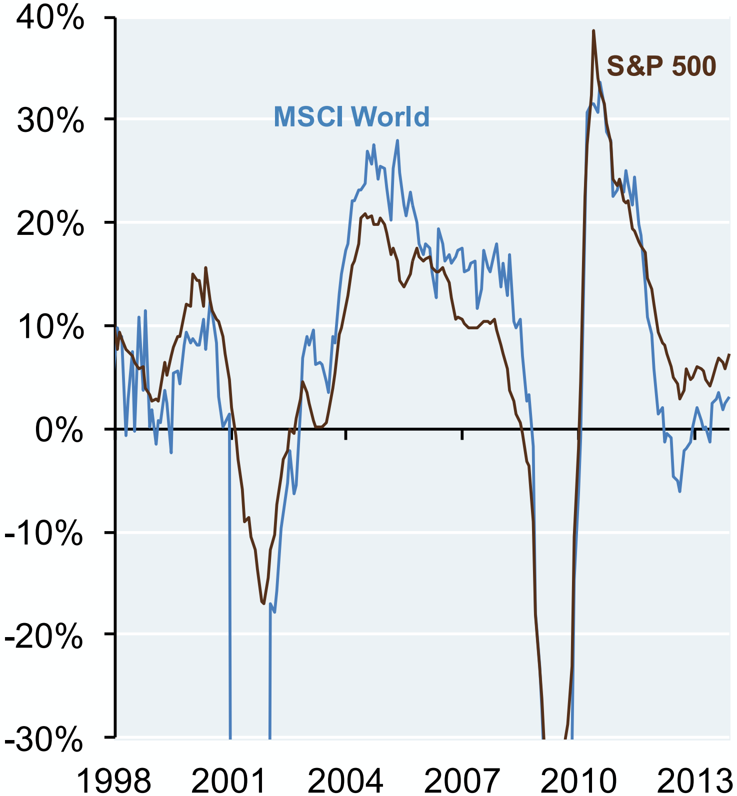
State of Arizona Retirement System

Michael Cembalest
Chairman of Market and Investment Strategy
J.P. Morgan Asset Management

J.P.Morgan
Asset Management

Even though 2013 saw profit and GDP growth rates decline…

Y/Y percent change in 12-month forward earnings per share



Source: J.P. Morgan Securities LLC. November 2013.

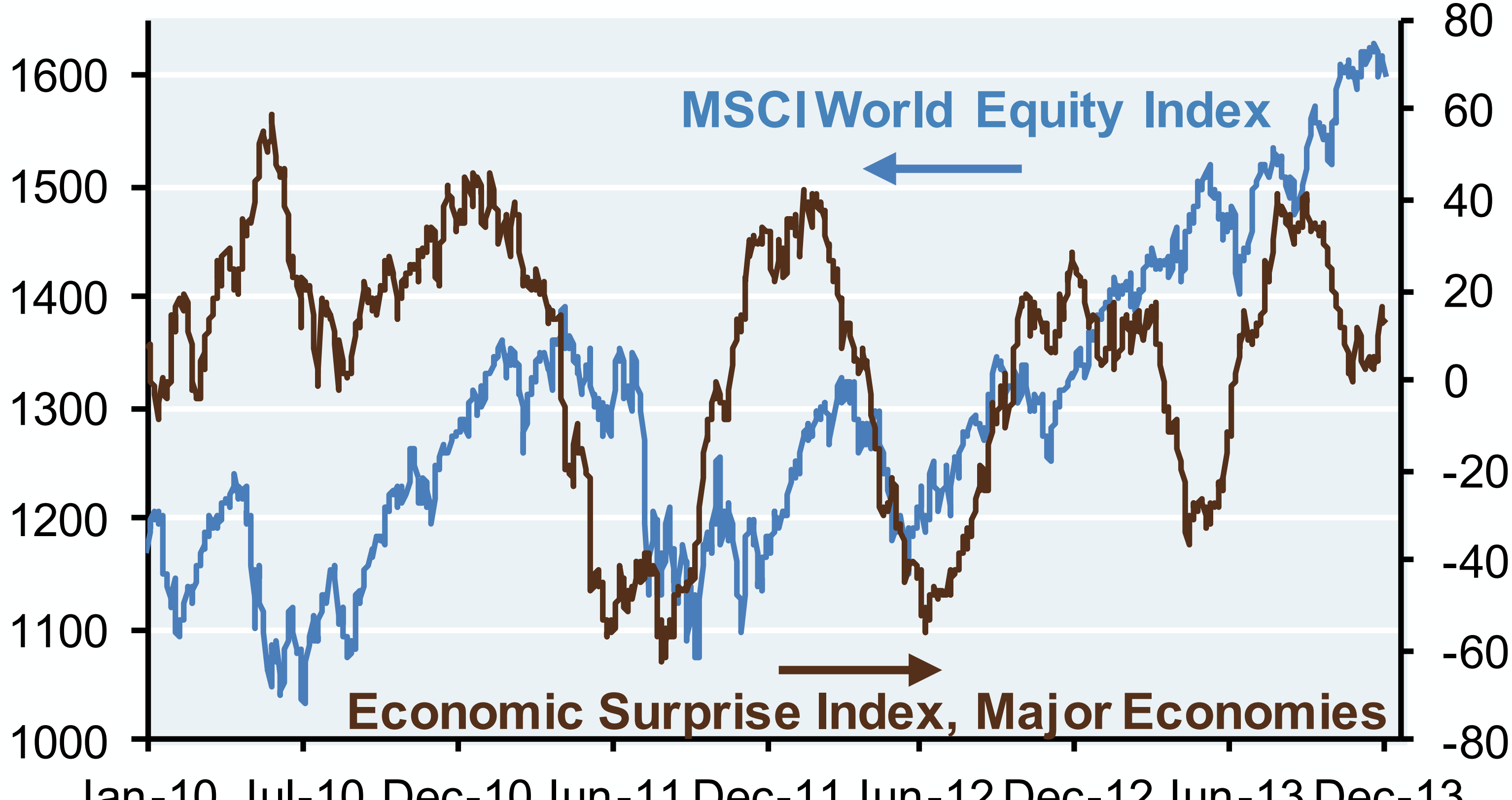
Y/Y percent change in real GDP

Source: International Monetary Fund. Q3 2013.

J.P.Morgan
Asset Management

Global equities diverging from economic surprises

Index level



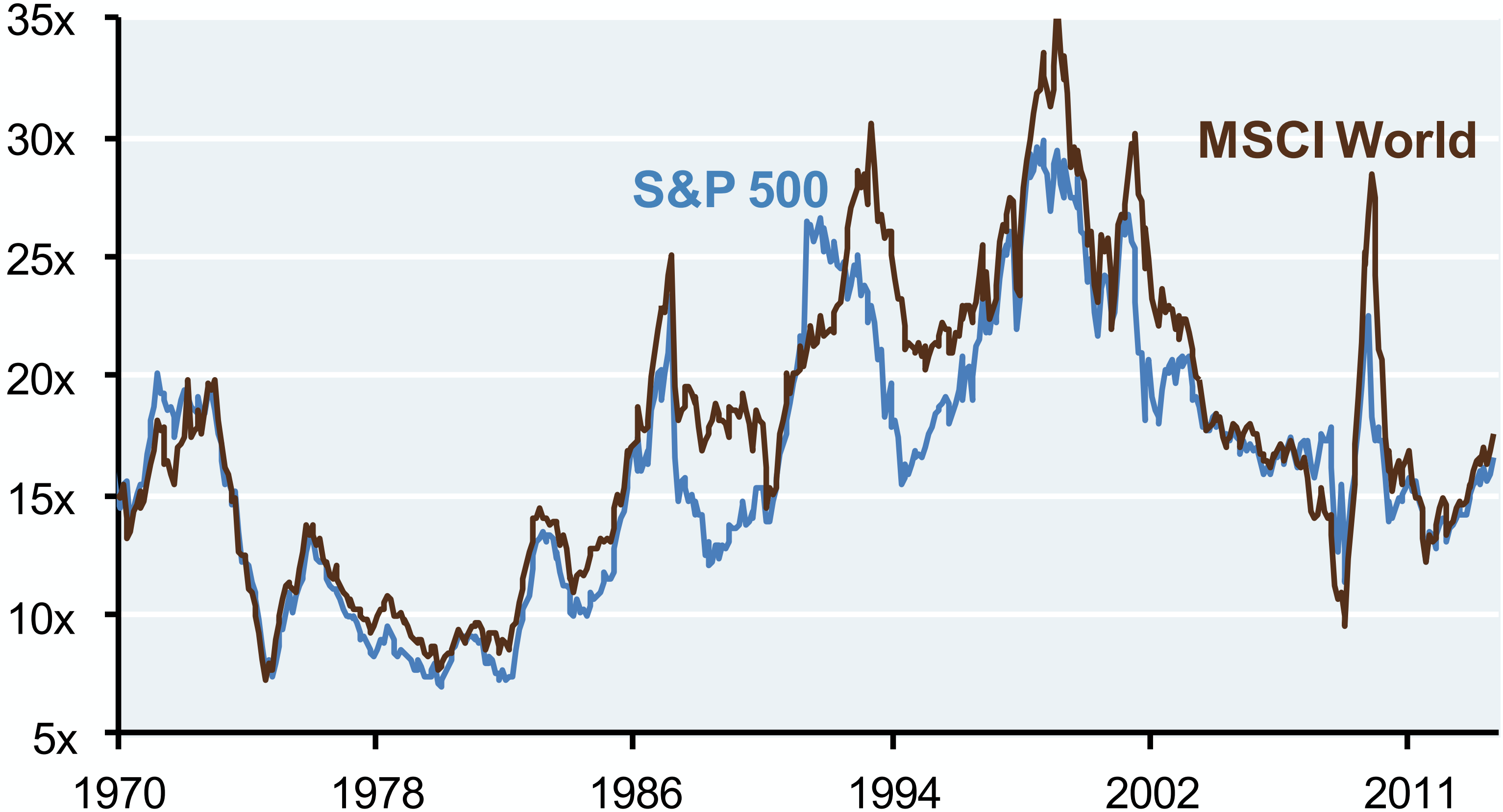
Source: Bloomberg. December 2013.

J.P.Morgan Asset Management

…as P/E multiples rose back to long term averages

Global and U.S. trailing price-to-earnings ratios

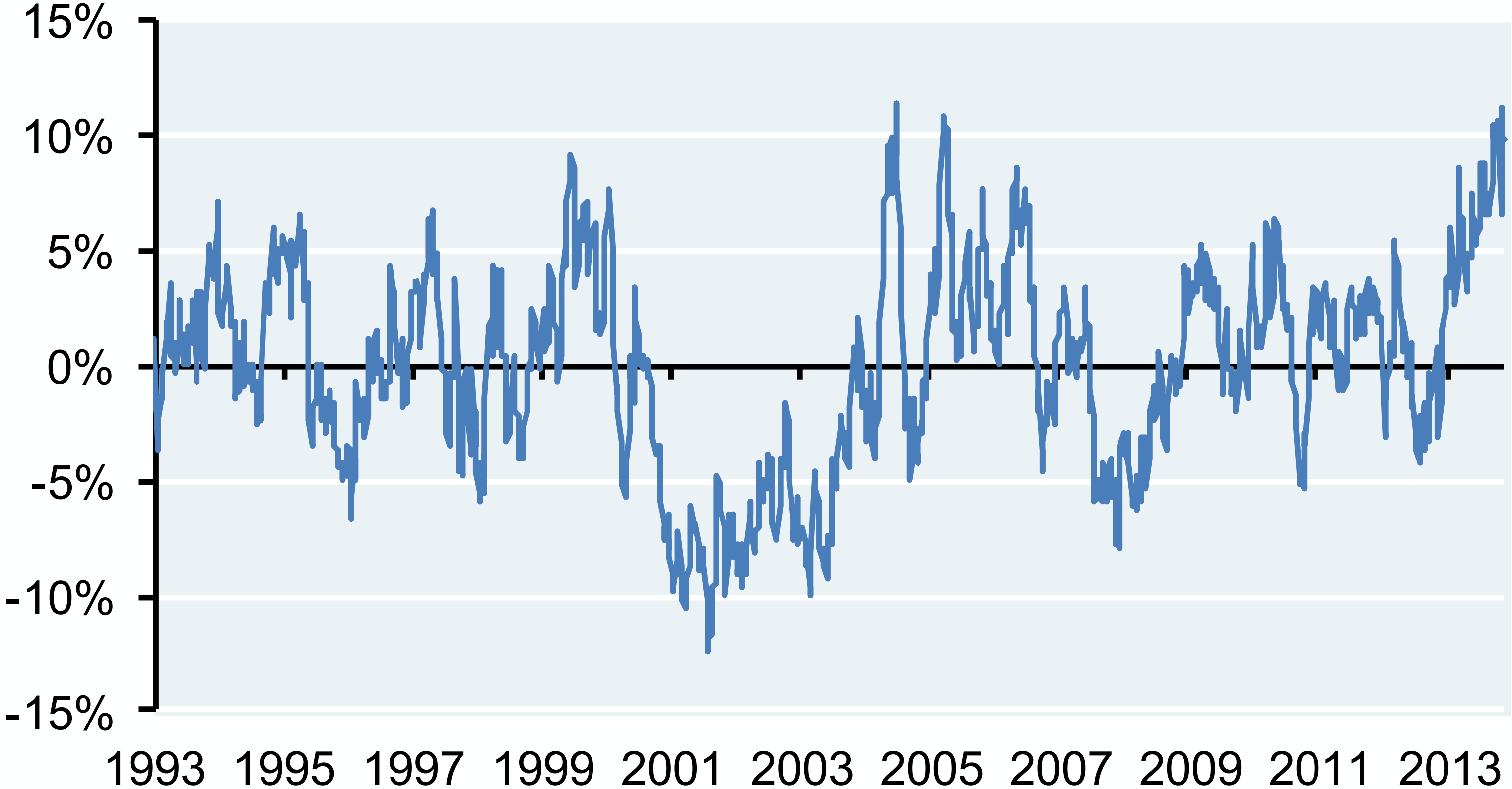
Multiple



Source: Bloomberg, Empirical Research. JPM Securities. November 2013.

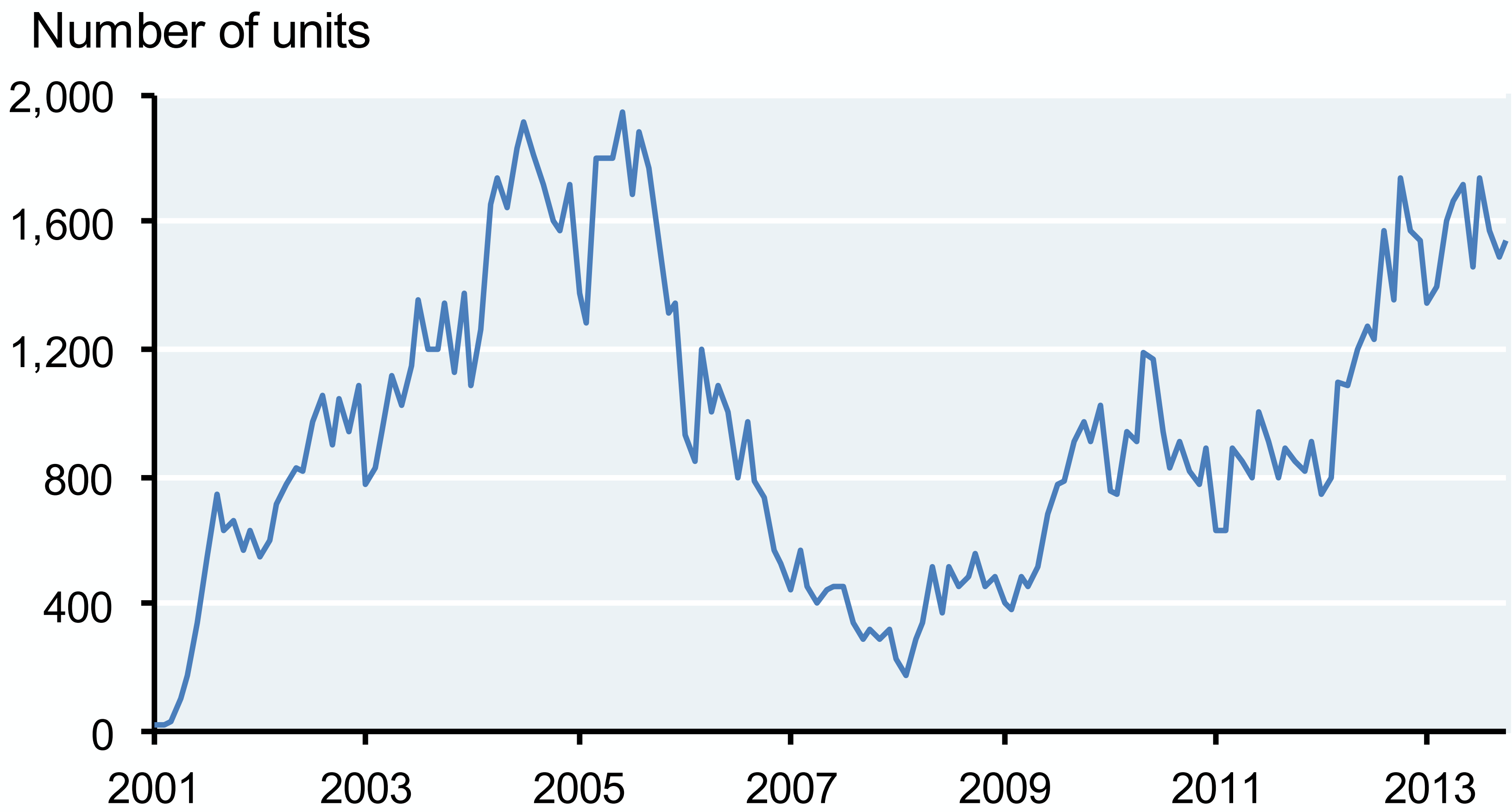
Speculative stock-bond position

Net CFTC stock-bond futures position, percent



Source: CFTC, J.P. Morgan Securities LLC. November 2013.

Even the home flippers are back



Source: Empirical Research Partners, PropertyRadar.com. October 2013.

Where to from here? Is market optimism justified?

In the U.S., we believe it is given improving leading indicators

Rising U.S. business surveys point to rebound in earnings

Source: ISM, J.P. Morgan Securities LLC. November 2013.

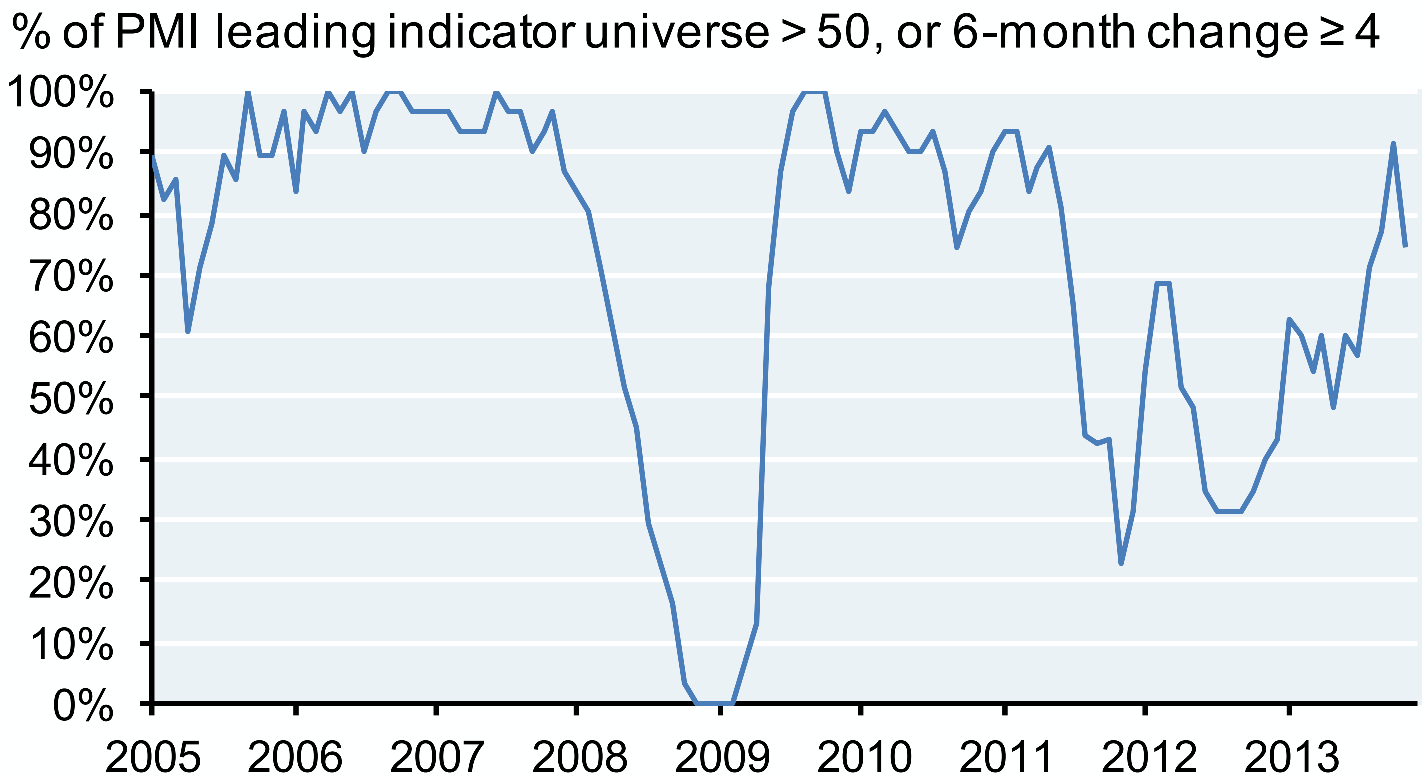
In Europe the same trends are in place, at least for now

Similar but more muted outcome in the Eurozone

Source: Markit, J.P. Morgan Securities LLC. December 2013.

J.P.Morgan Asset Management

Rising number of countries in expansion mode

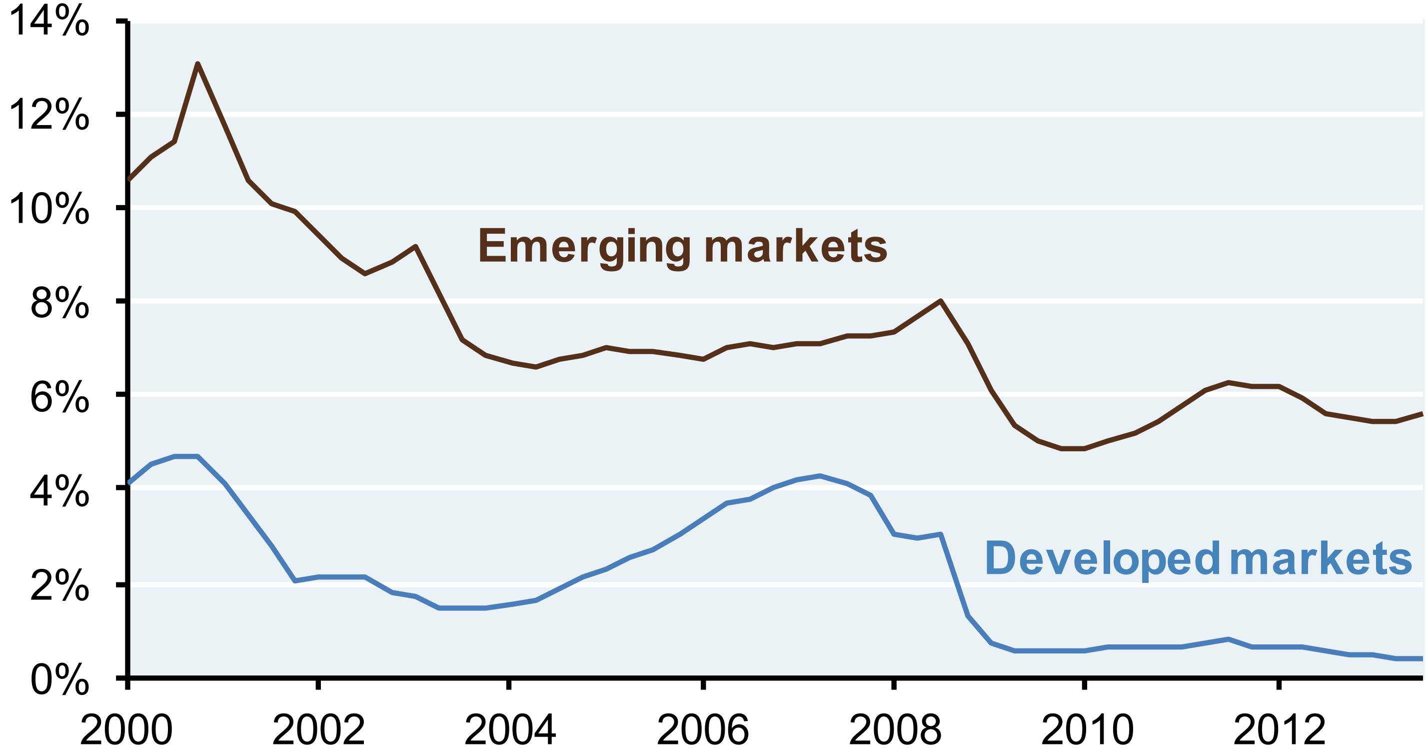


Source: Based on Markit's 35-country universe using data as of November 2013. PMI of 50 denotes expansion.

J.P.Morgan Asset Management

Few headwinds from rising short term policy rates…

Central Bank policy rates, percent

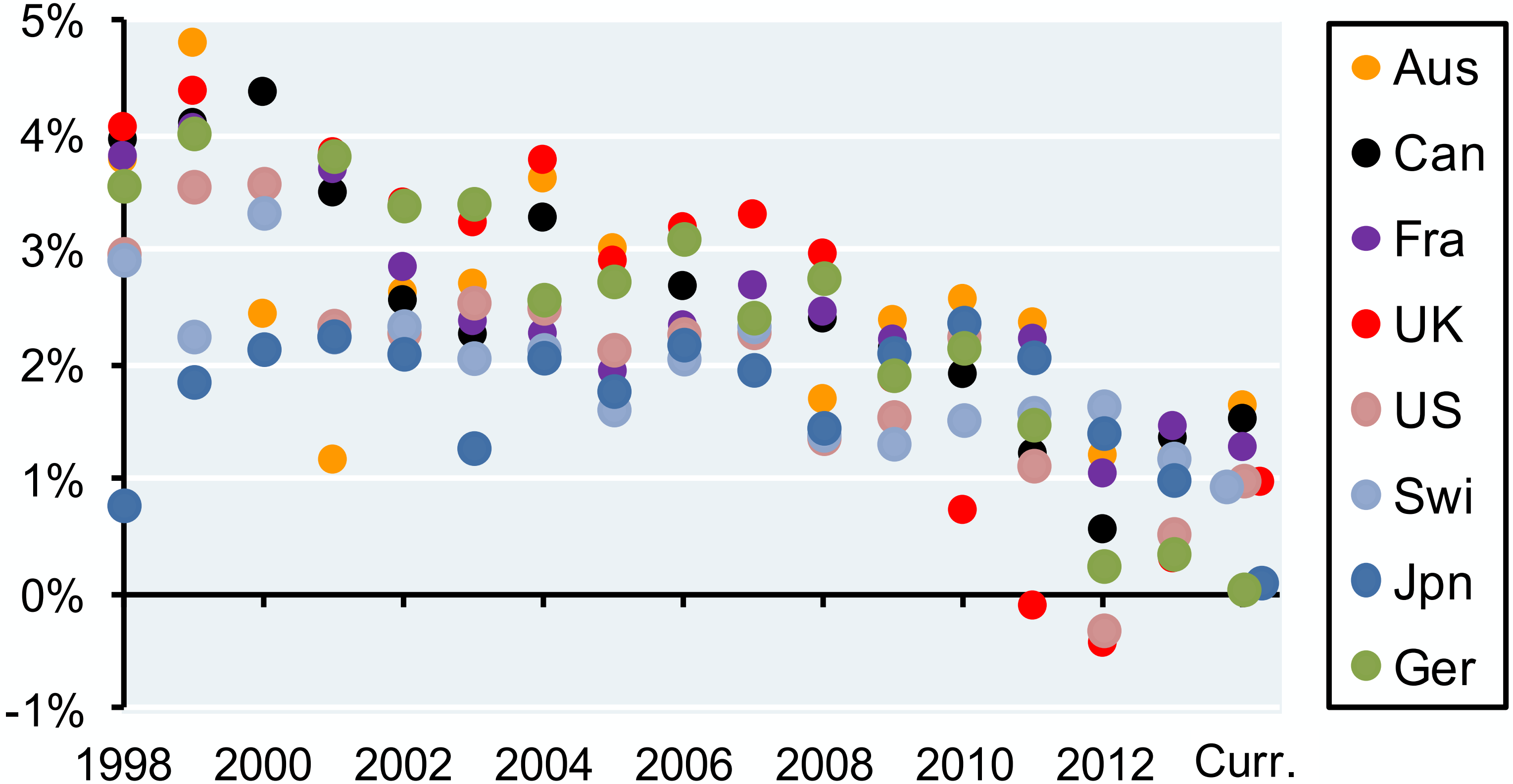


Source: Various central banks, J.P.Morgan Asset Management. Sept 2013.

…and the increase in developed world bond yields is modest so far

…while longer term rates rise modestly higher

10-year gov't bond yields less core inflation, percent

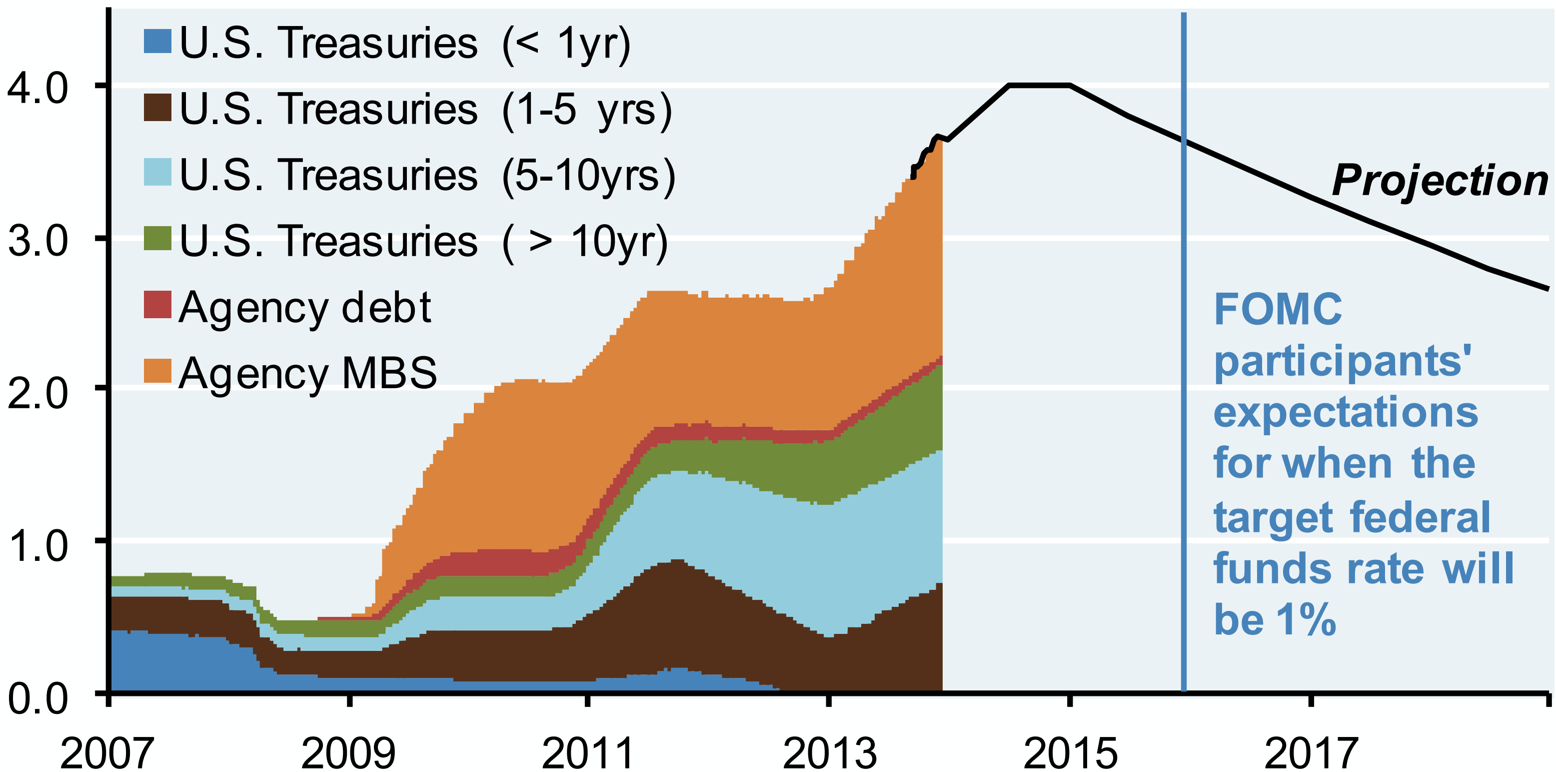


Source: Various central banks and statistical offices. November 2013.

J.P.Morgan Asset Management

Fed's balance sheet will remain high for a long period

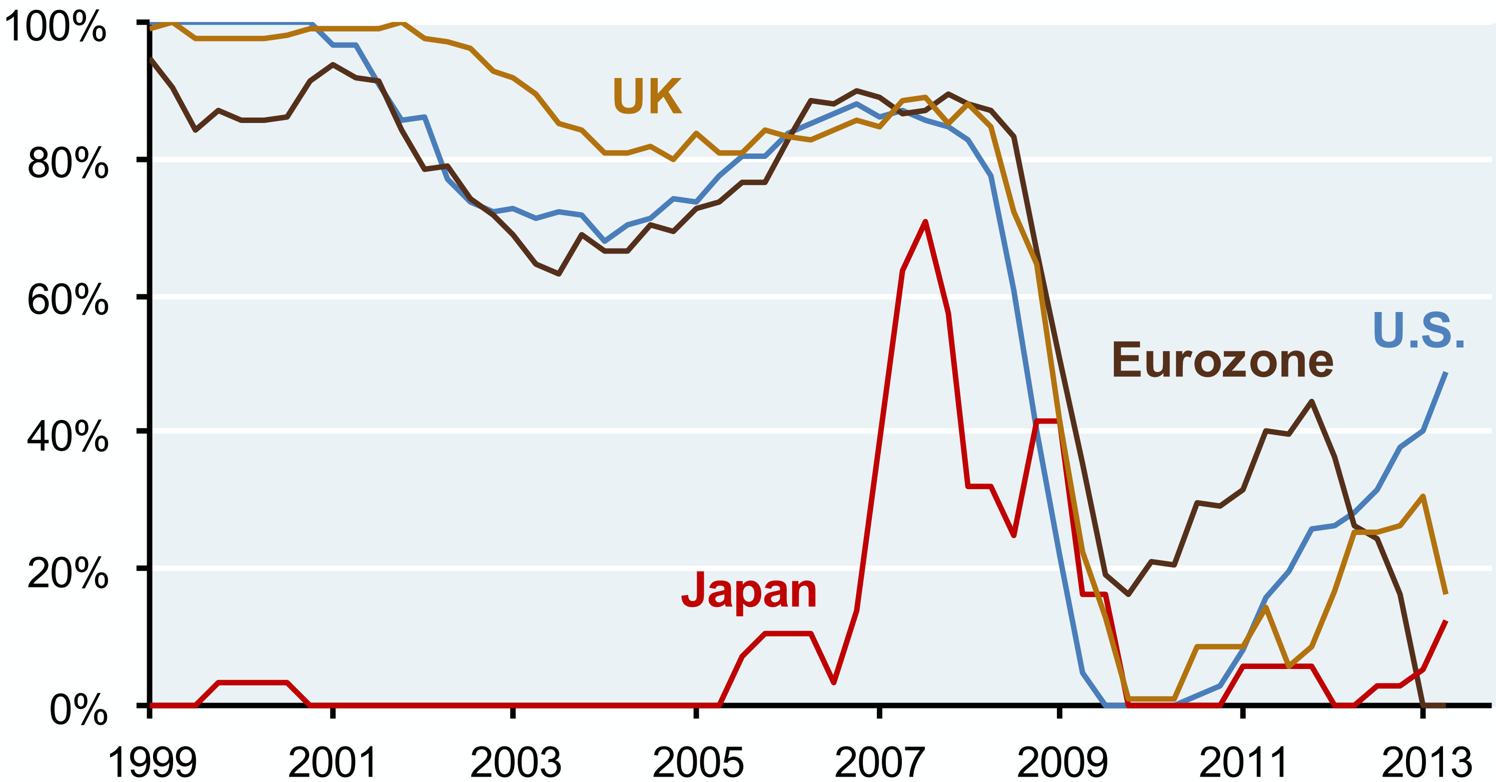
Fed securities holdings, USD trillions



Source: Federal Reserve, J.P. Morgan Asset Management. November 2013.
FOMC: Federal Open Market Committee.

U.S. economy looks closer to “normal” than other developed markets

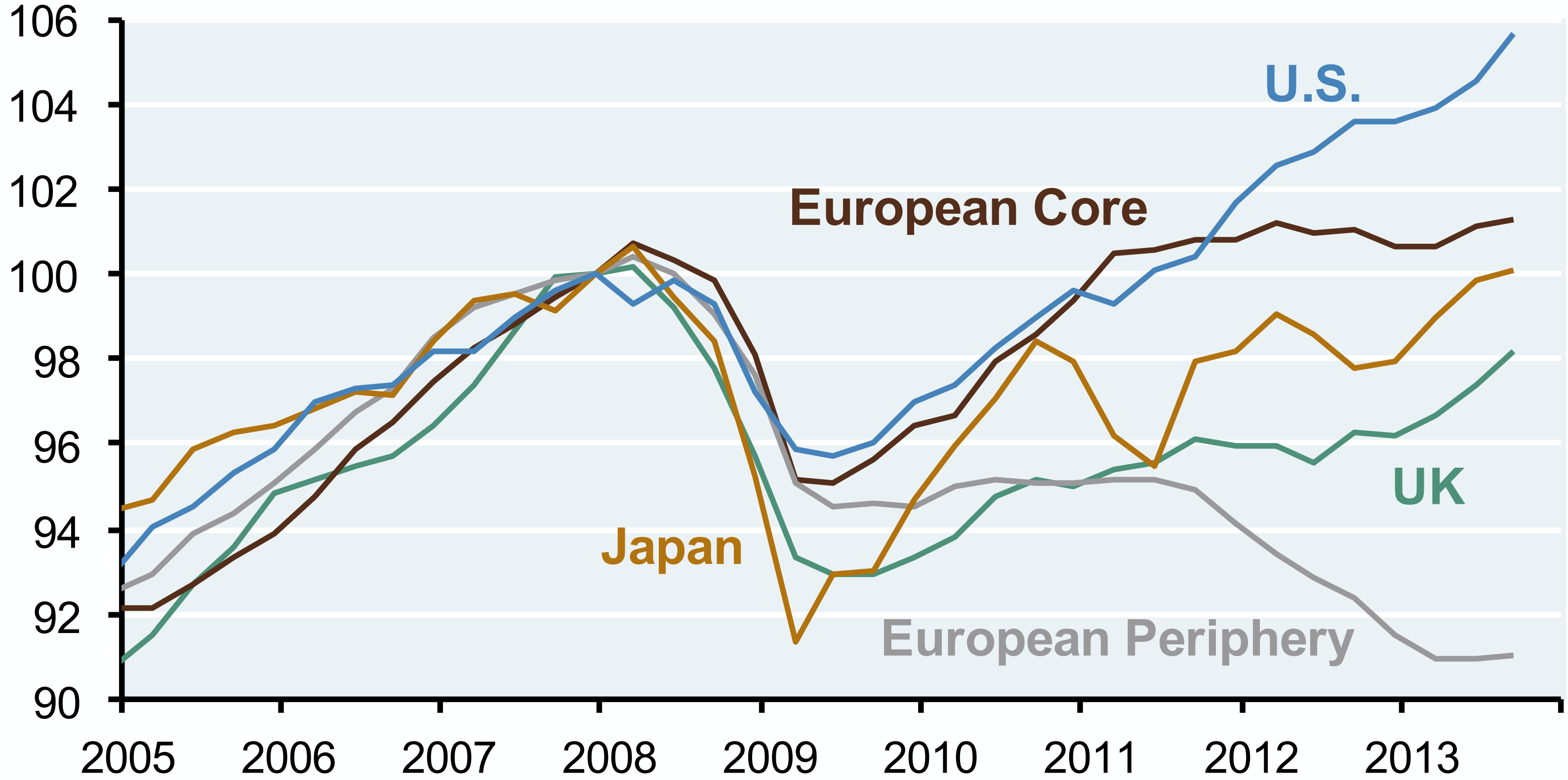
Net private sector credit creation as % of public plus private



Source: JPMAM, FRB, ECB, Bank of England, Bank of Japan. Q2 2013.

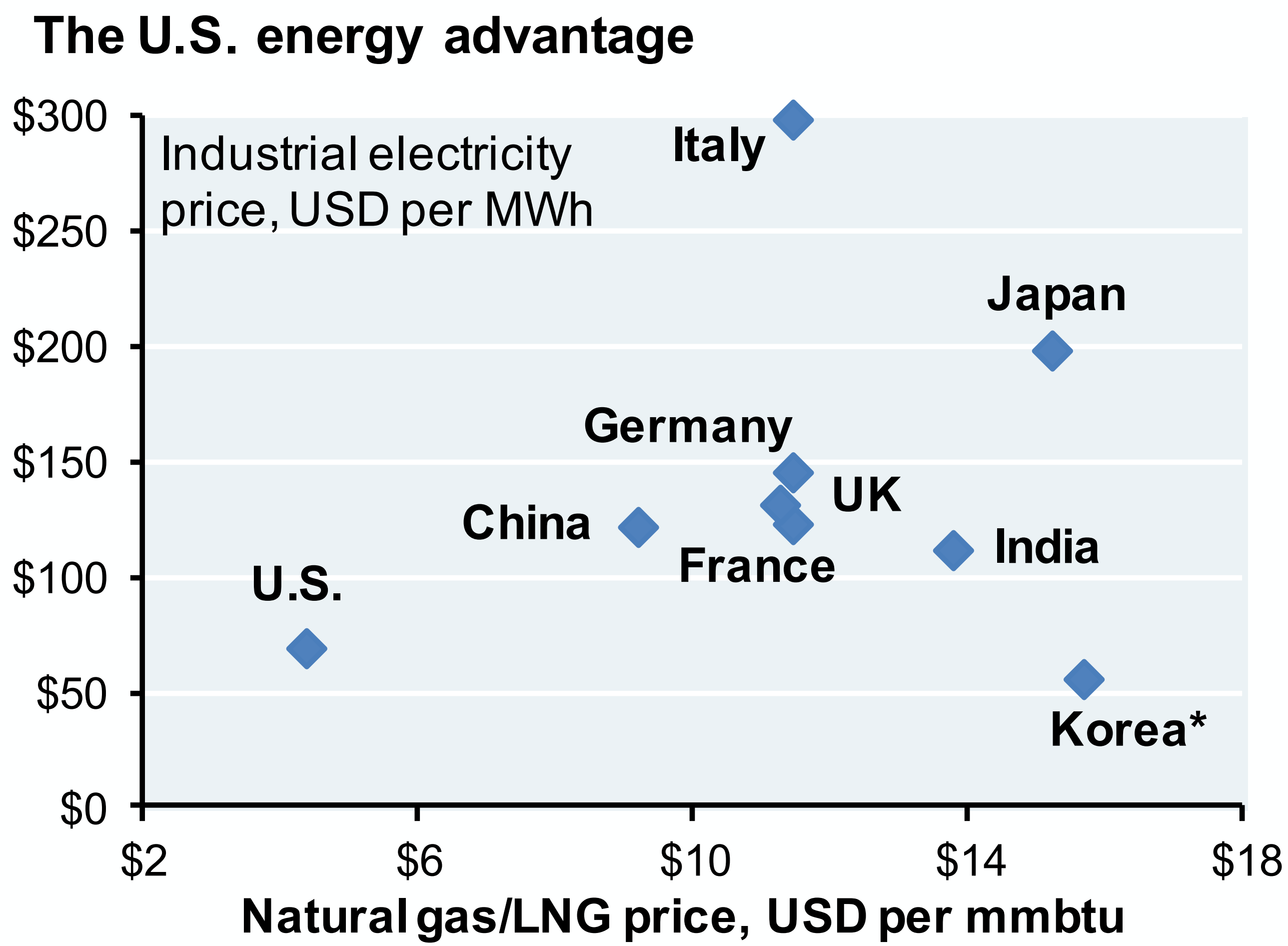
The post-recession rebound in the developed world

Real GDP, Index, 12/31/2007 = 100



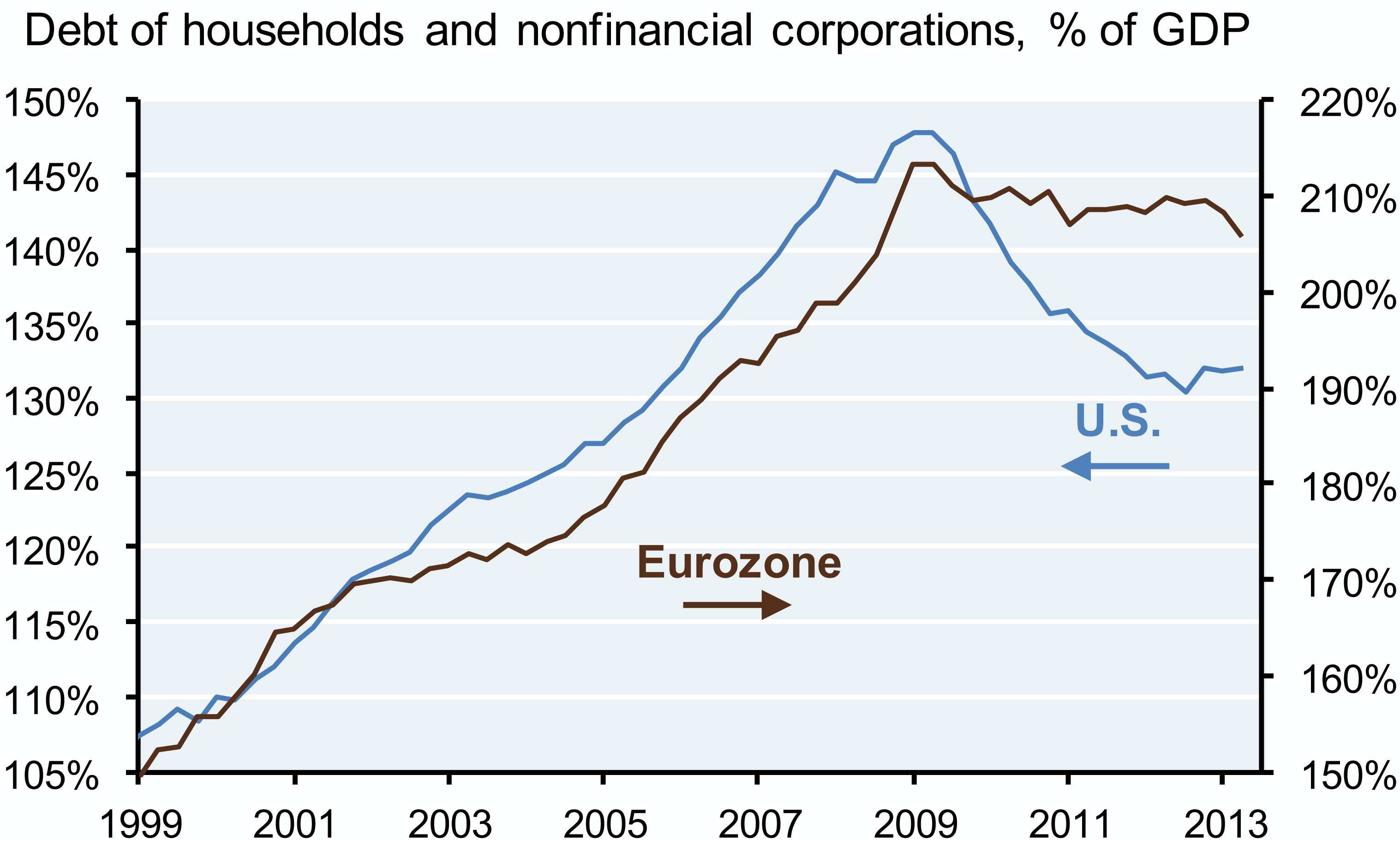
Source: Various country sources, Haver Analytics. Q3 2013.

J.P.Morgan Asset Management



Source: Bloomberg, FERC, China NDRC, World Bank, IEA, Reuters. * Korean industrial electricity prices are heavily subsidized.

U.S. deleveraging appears to be slowing



Source: FRB, BEA, Eurostat. Q2 2013.

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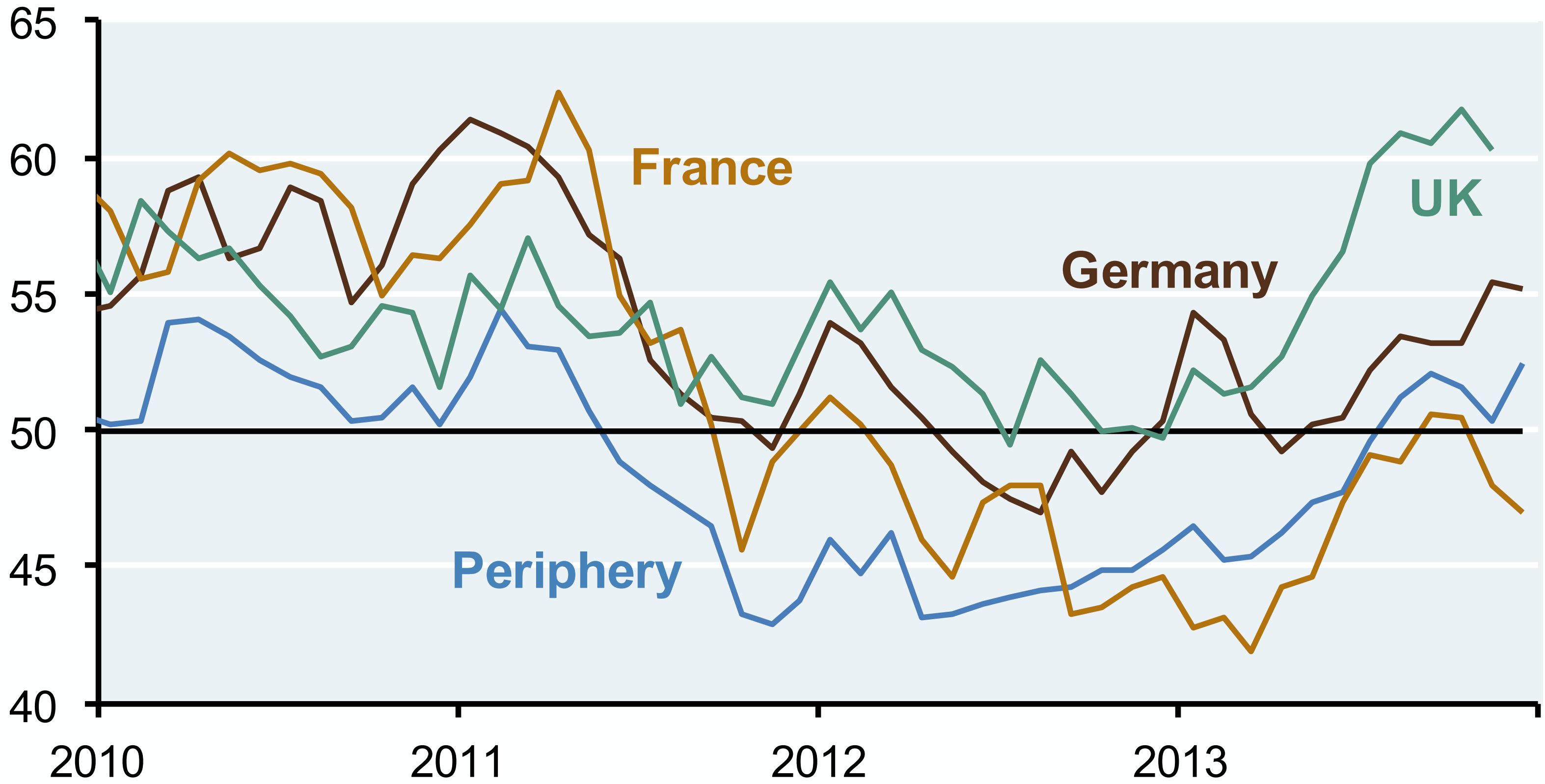
Eurozone survey rebound: everywhere but France

Eurozone rebound: everywhere but France

Purchasing Managers' Composite Index, level



Source: Markit, J.P. Morgan Securities LLC. December 2013.

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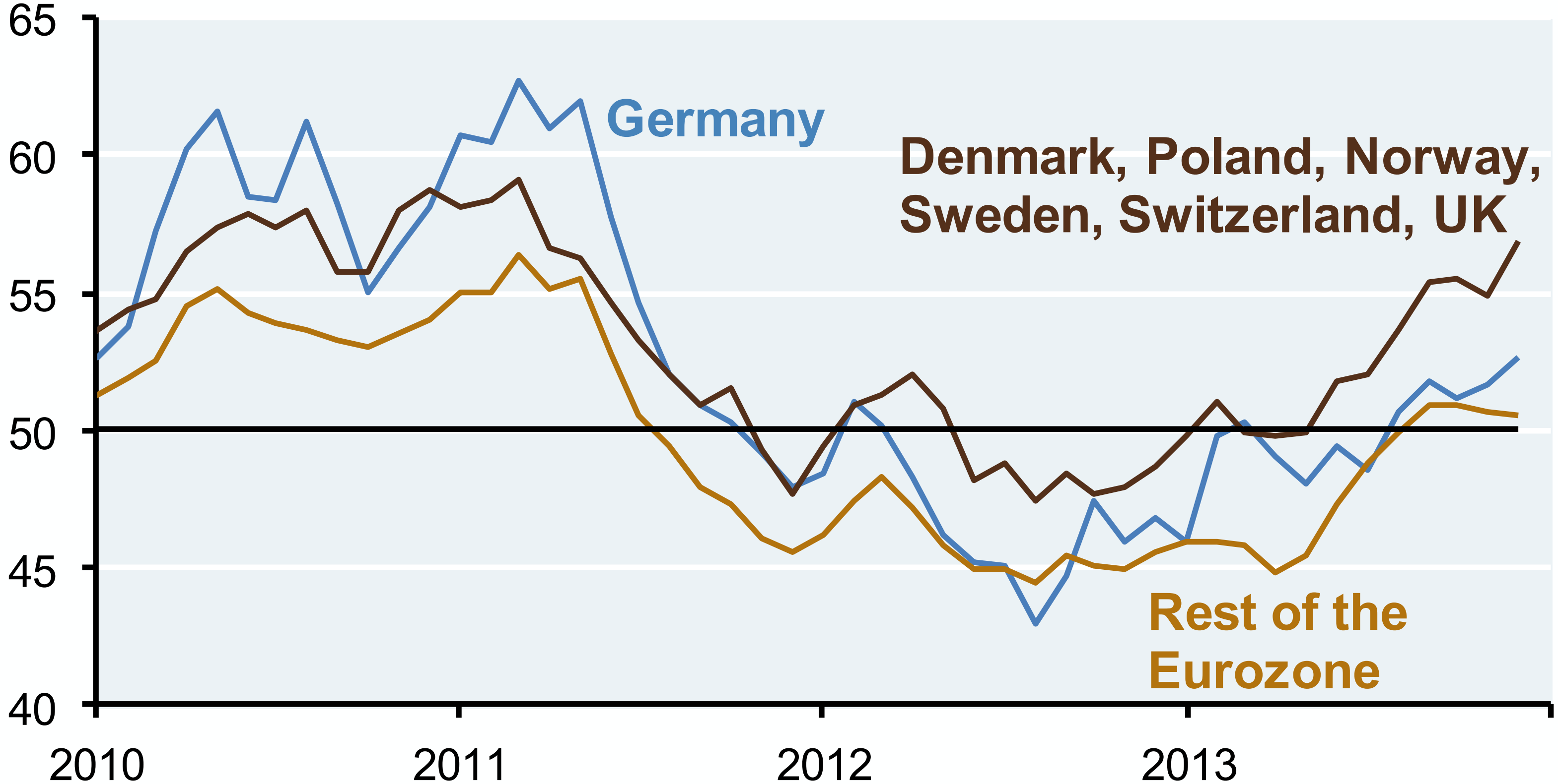
"Non-Eurozone Europe" doing better

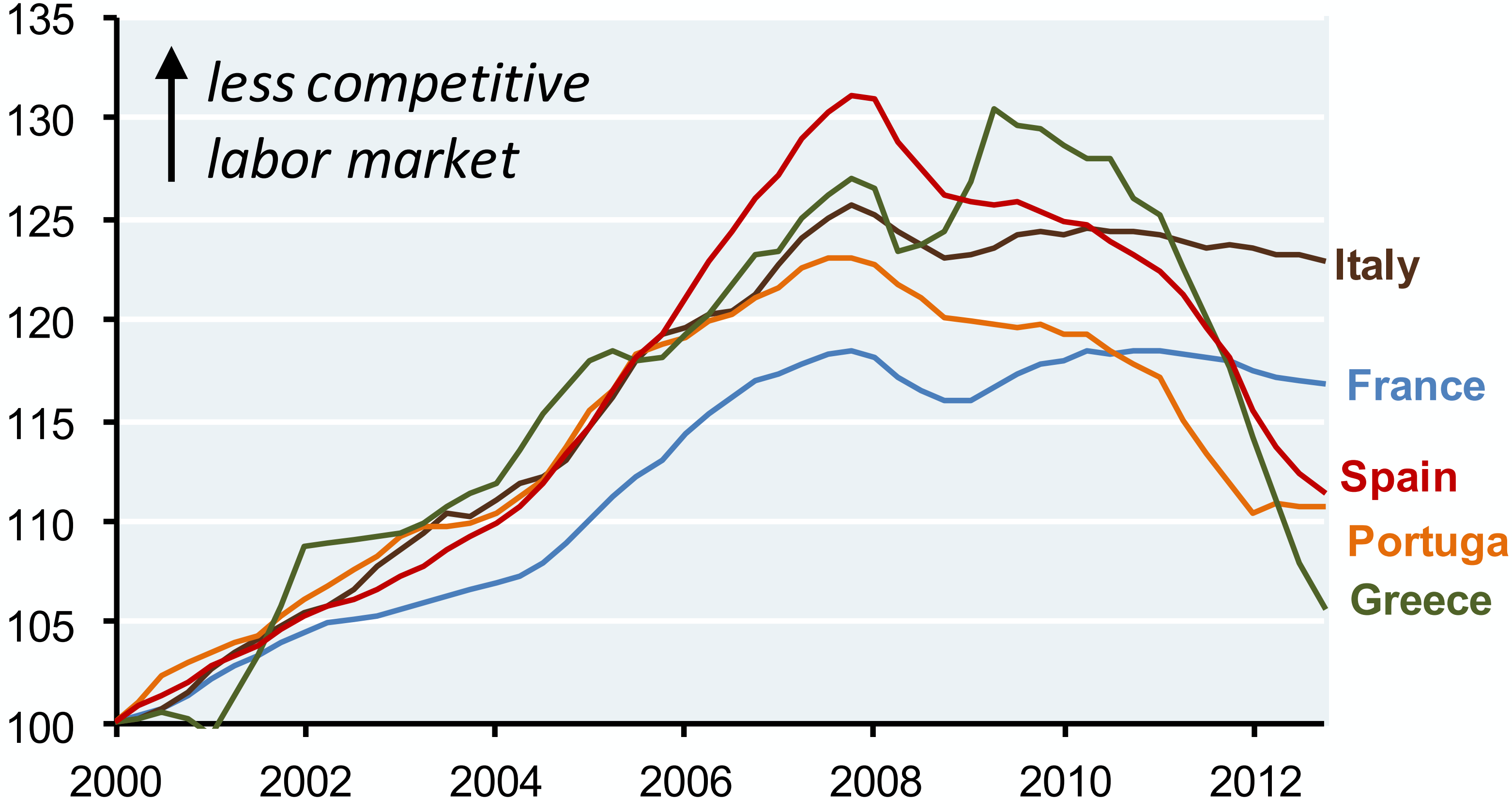
Purchasing Managers' Manufacturing Index, level



Source: Markit, J.P. Morgan Securities LLC. November 2013.

Competitiveness improvements in some countries are notable

Unit labor costs relative to Germany, index, Q4 2000=100

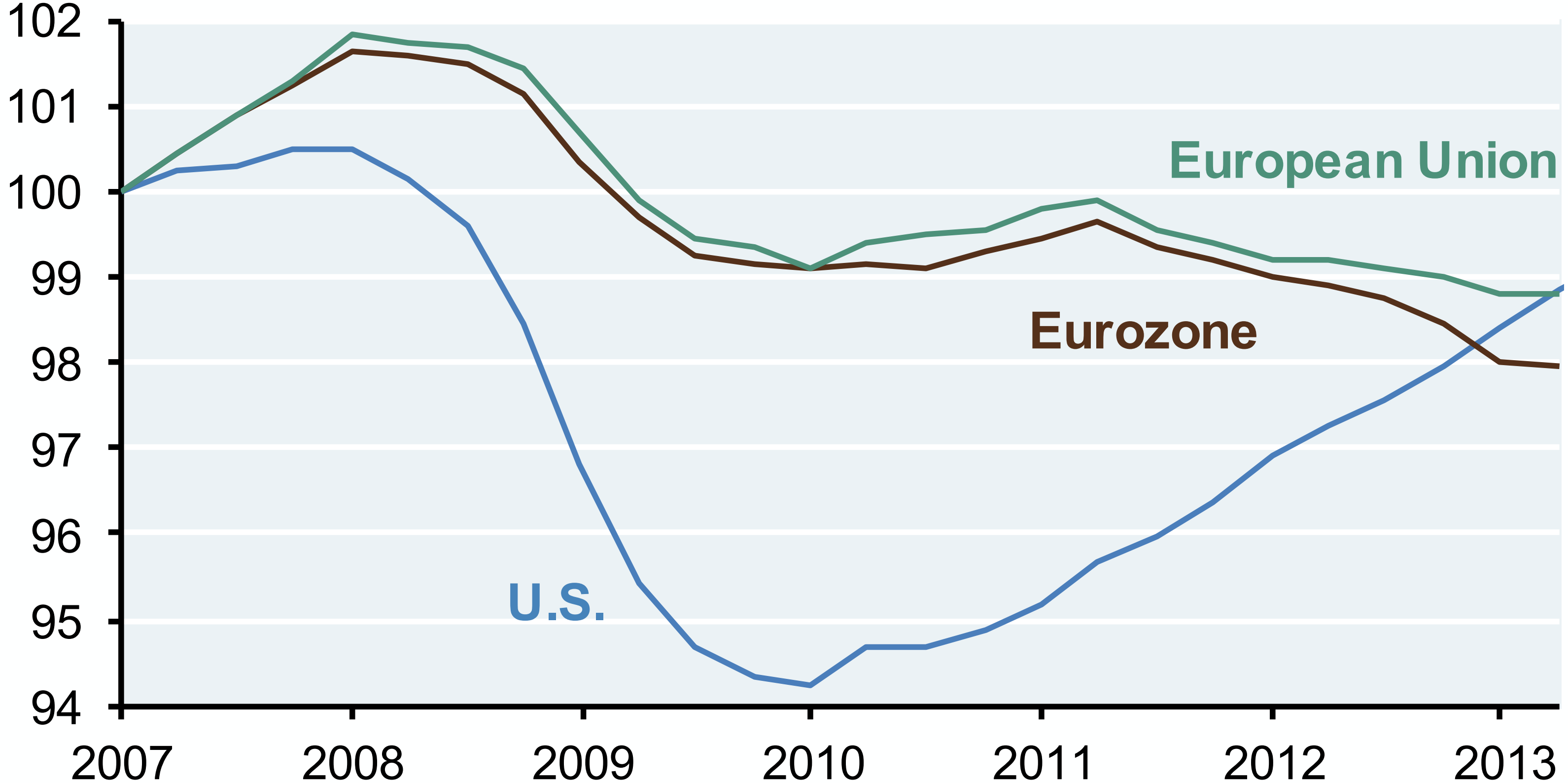


Source: Eurostat, J.P. Morgan Asset Management. Q3 2013.

The phrase "developed economy" masks extreme differences in the flexibility of labor markets and the speed of job destruction/creation

Employment: two ships passing in the night

Index of employment, Q1 2007 = 100

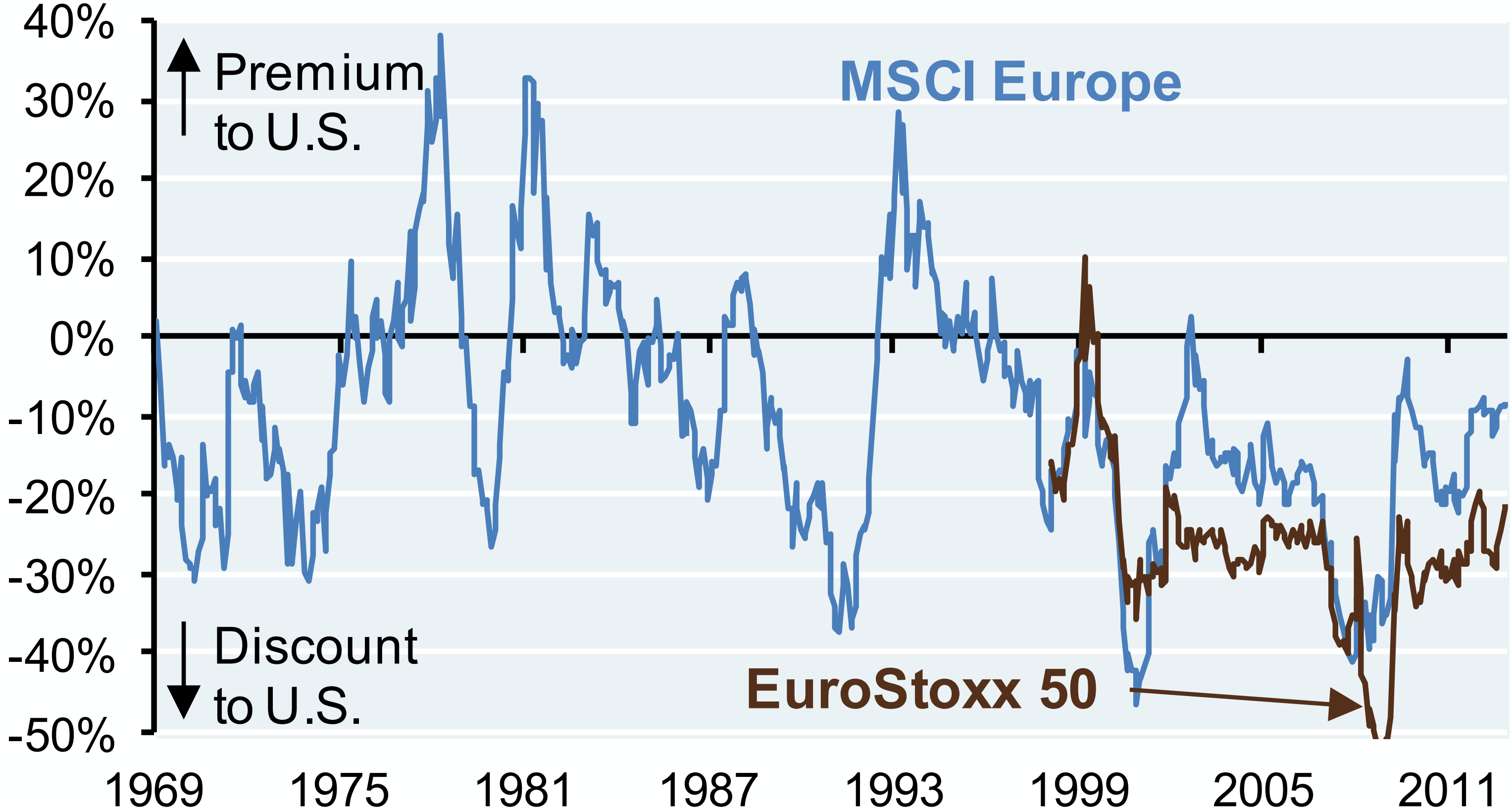


Source: BLS, Eurostat. Q2 2013.

European equity discount to the U.S. continues to fall

European equity discount to U.S. continues to fall

European P/E ratio divided by U.S. P/E ratio

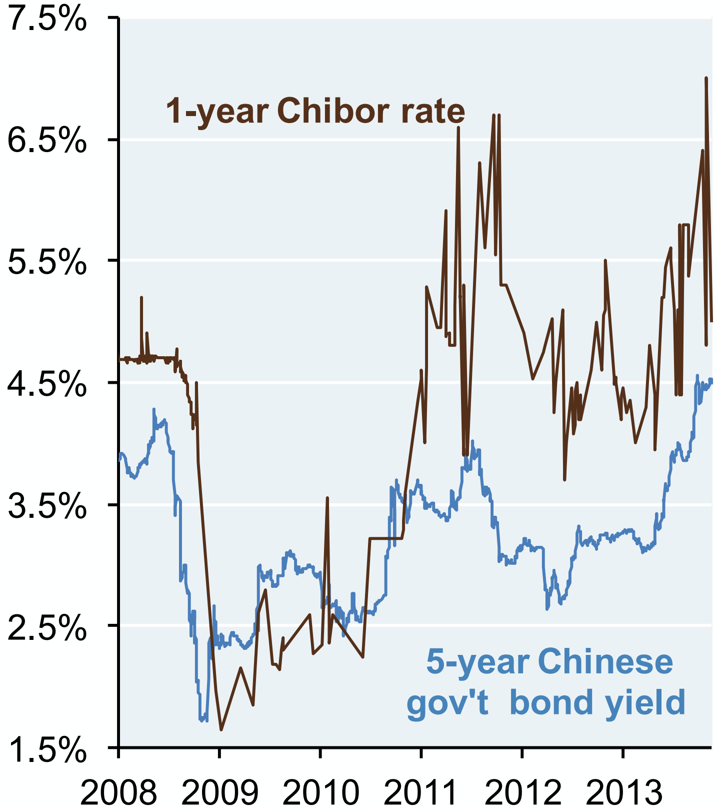


Source: MSCI, Datastream, Factset. November 2013.

J.P.Morgan Asset Management

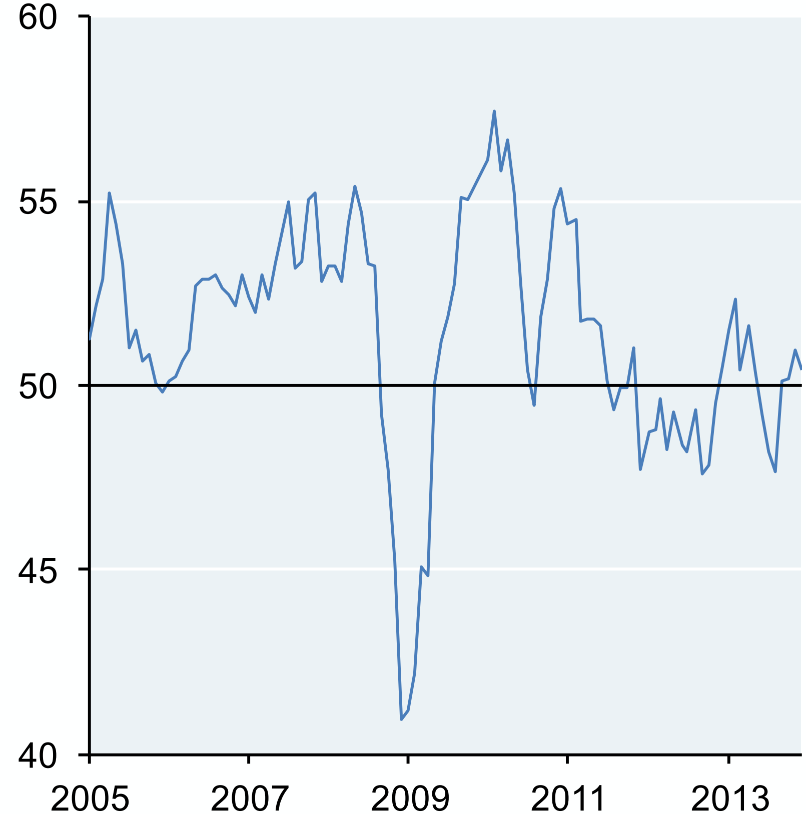
EM risks not centered on China, which is experiencing stable growth around 7% despite rising interest rates

Chinese interest rates, percent



Source: Bloomberg. January 2013.

Purchasing Managers' Manufacturing Index, level



Source: Markit. November 2013.

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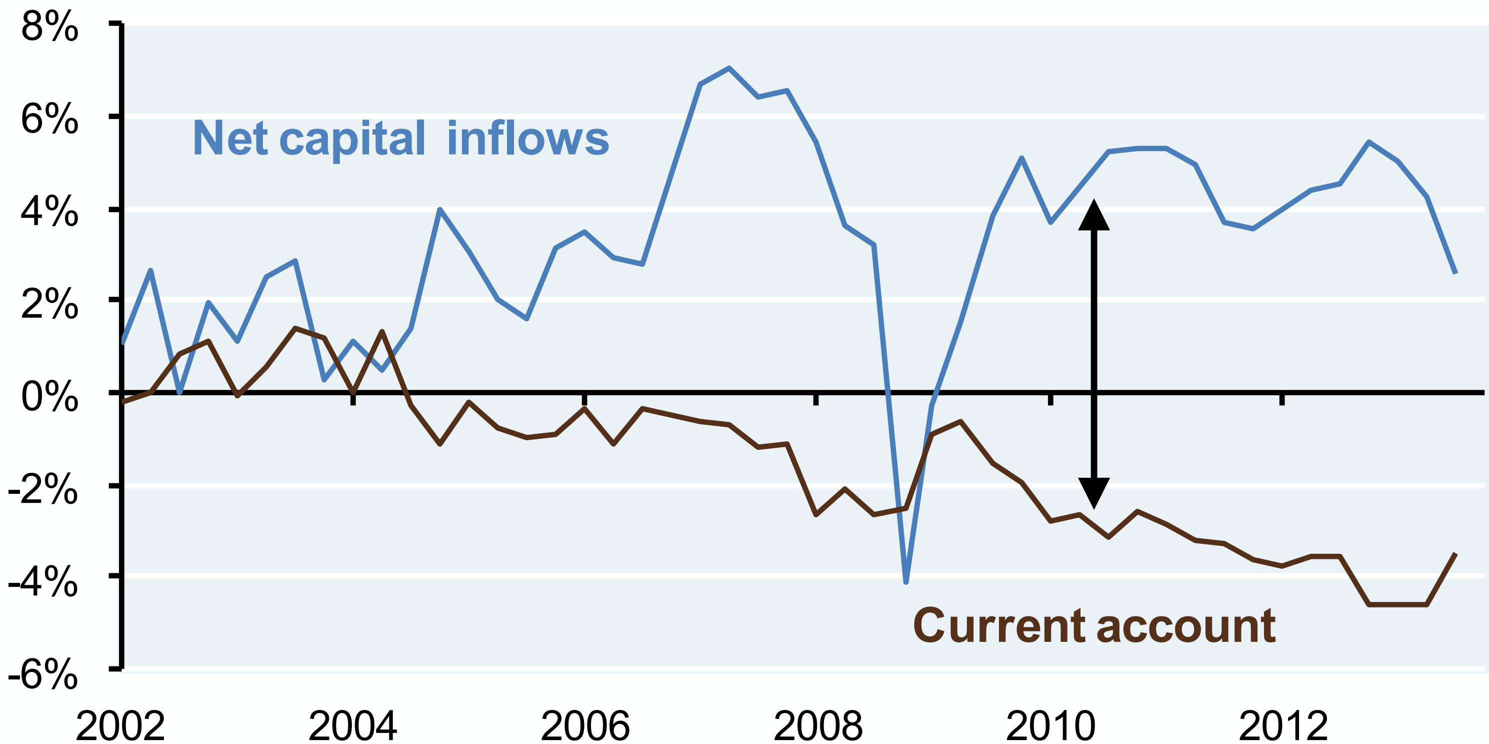
Focus for EM continues to be the EM debtor nations: a classic balance of payments problem…

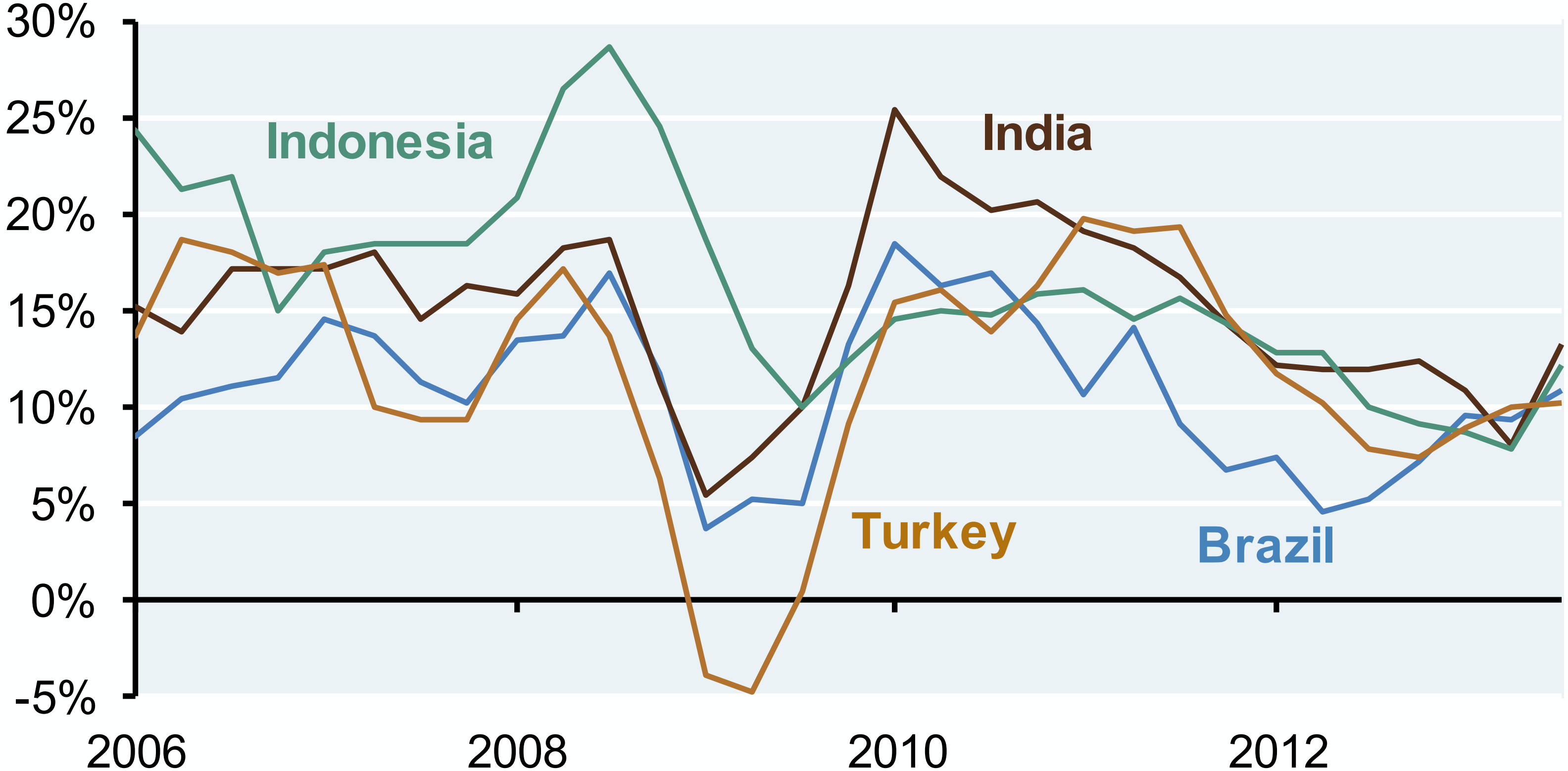
Rising vulnerability to capital outflows in the Big 4: Brazil, India, Indonesia and Turkey, percent of GDP



Source: National Central Banks, J.P. Morgan Asset Management. Q3 2013.

…defined by slowing growth

Y/Y percent change in nominal GDP



Source: National statistical agencies. Q3 2013.

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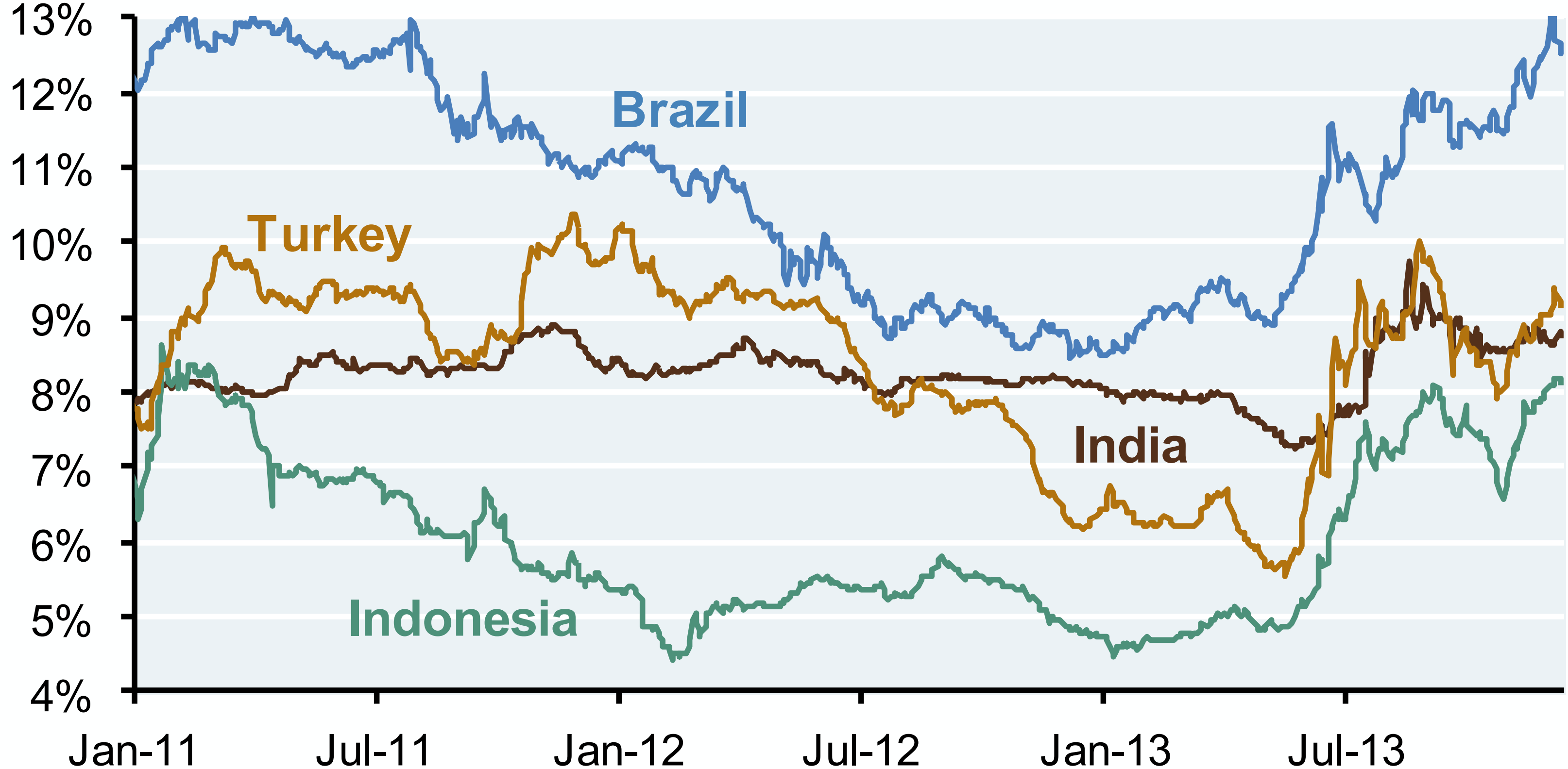
Debtor nation bond yields rising sharply

5-year government bond yields, percent



Source: Bloomberg. December 2013.

Some differences vs. prior EM crises

EM external account measures, past and present, with key differences vs. prior episodes circled in red

	1980's: ARG, BRL, MEX, VEN	1996: INDO, KOR, MAL, THA	Today*: BRL, IND, INDO, TUR
External Debt (% of Exports)	401%	130%	156%
Interest on External Debt (% of Exports)	39.7%	6.6%	4.6%
Reserves (% of External Debt)	7.7%	28.8%	61.6%
Current Account (% of GDP)	-5.1%	-4.5%	-3.7%
Exchange Rates vs. the USD	-97.5%	-61.1%	-13.7%
Exchange Rate Type	Managed	Managed	Floating

Source: IMF, Economist Intelligence Unit, JPMAM. *2013 YTD. December 2013.

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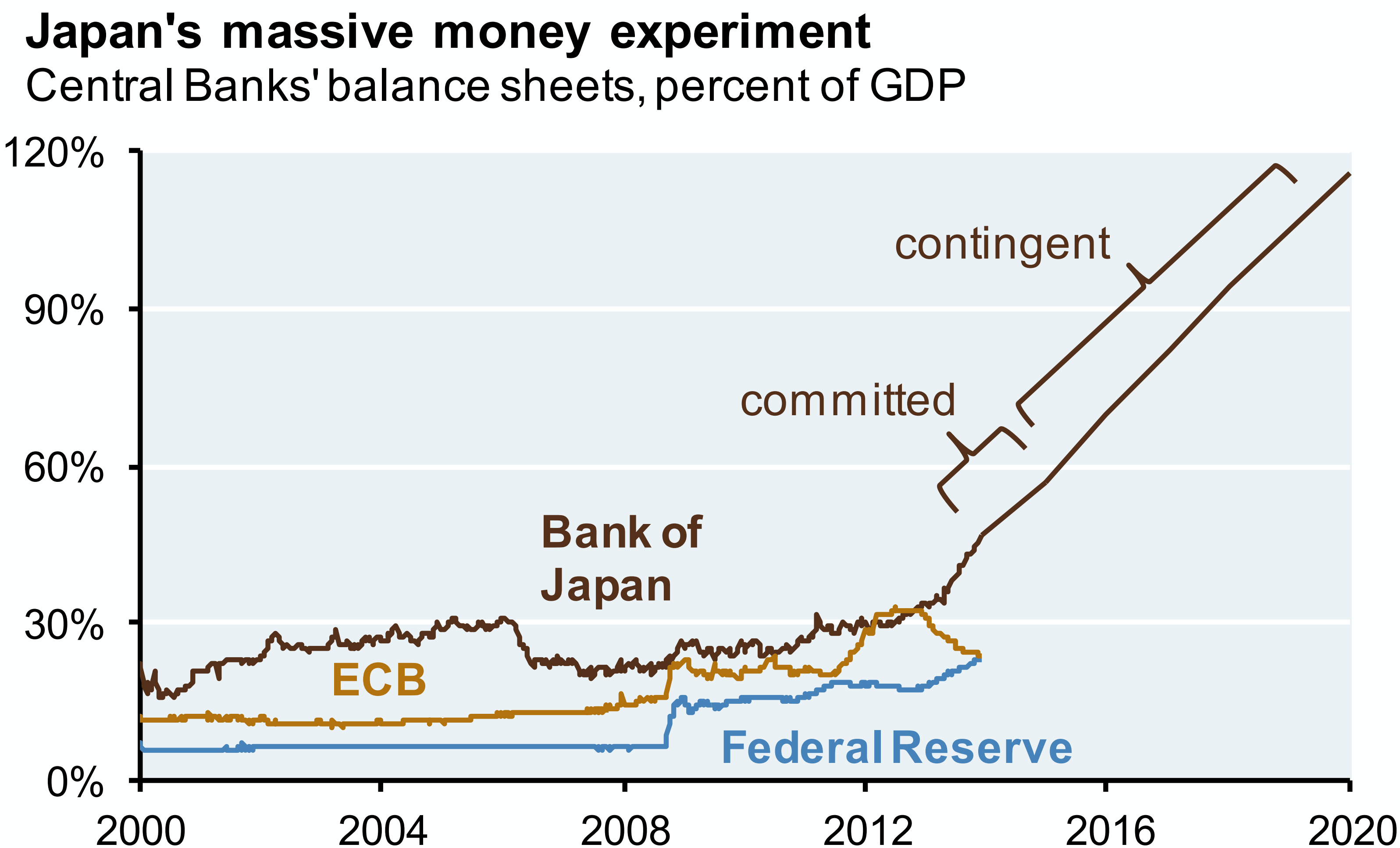


Source: Federal Reserve, ECB, Bank of Japan, JPMS LLC. November 2013.

We expect 2014 to mark a return to more traditional risk/return relationships

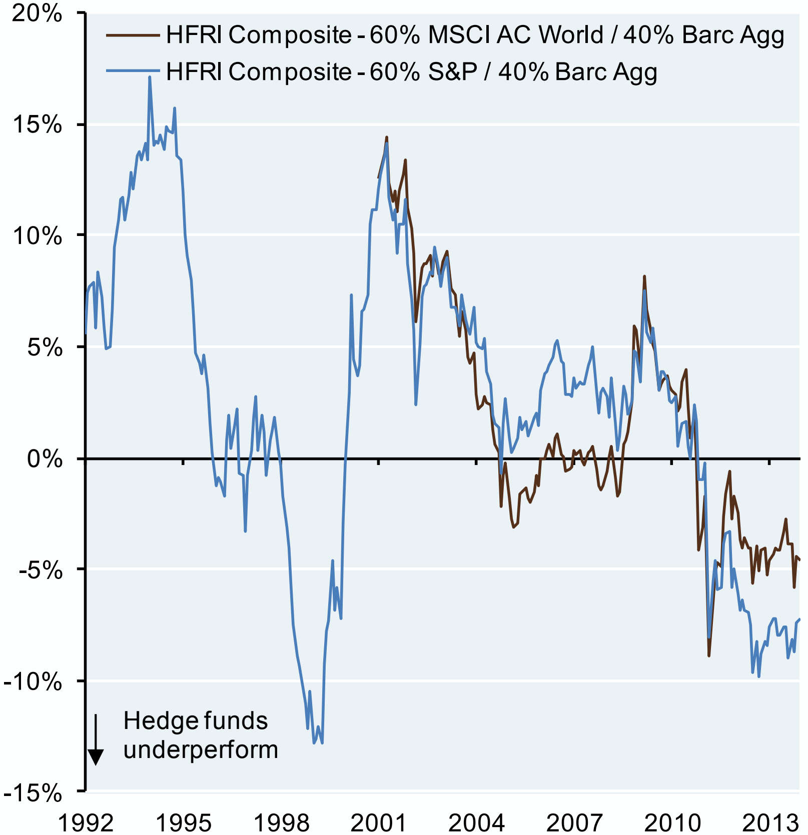
S&P 500 time period	Annualized Return	Annualized Volatility
Post Bretton Woods to pre-crisis 10/1972 to 05/2008	10.9%	16.0%
Financial crisis 05/2008 to 03/2009	-53.0%	48.0%
Volatile, high-return post-crisis recovery 03/2009 to 12/2011	22.9%	21.4%
Easy money spreads to ECB, BoJ 12/2011 to 11/2013	23.1%	12.1%

Source: Bloomberg. November 2013. Based on S&P 500 total returns.

While the last 2 years have been difficult, it may be premature to assume a structural shift in hedge fund returns relative to equities

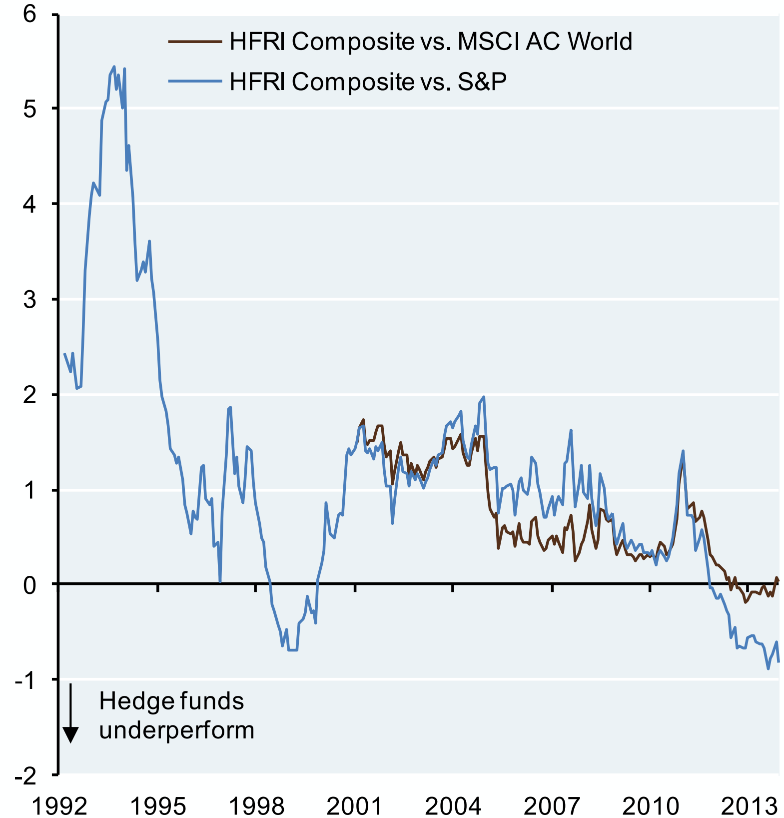
Hedge Funds vs. Stock bond portfolio

Hedge fund return less stock/bond return, rolling 2 years



Hedge Funds vs. Equity Markets

Hedge fund return/risk less equity return/risk, rolling 2 years



Source: Bloomberg. HFRI. November 2013. Monthly portfolio rebalancing. Volatility based on monthly returns.

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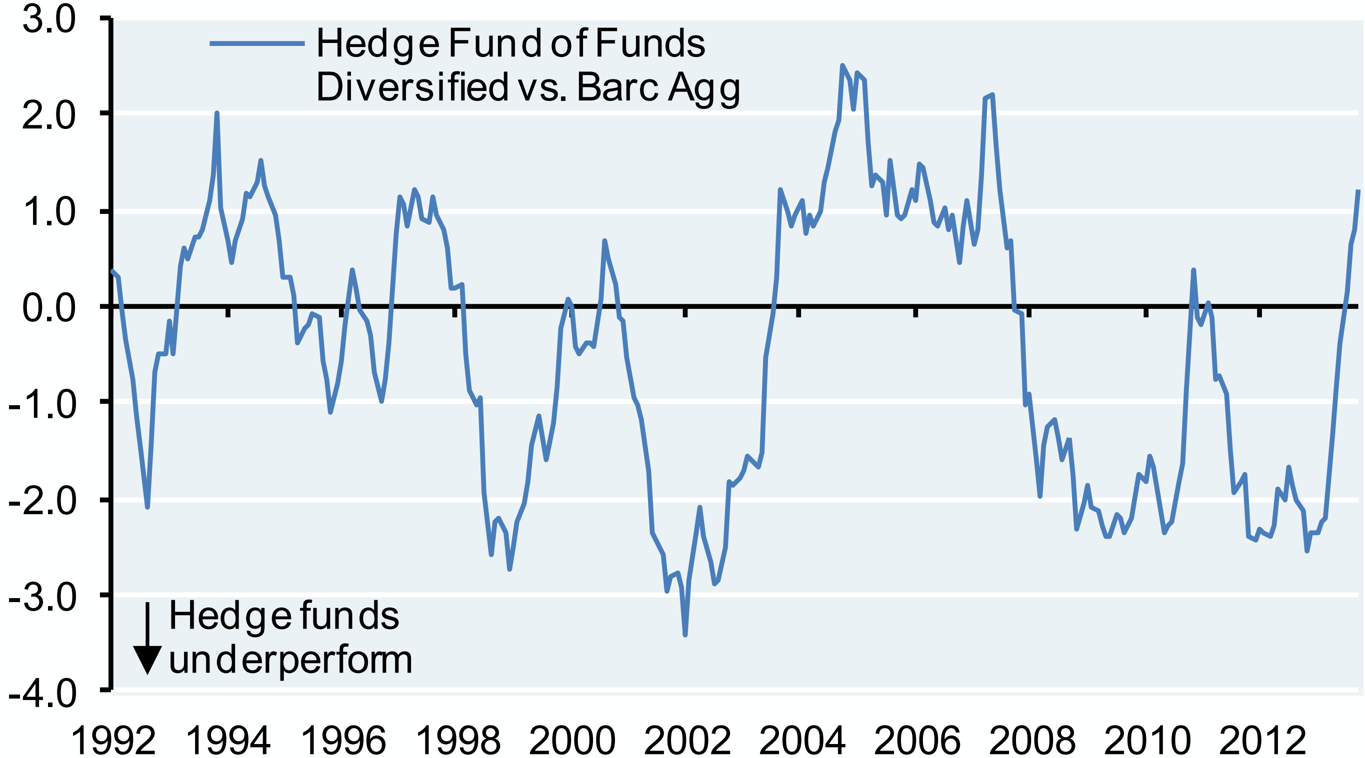
Diversified hedge funds have done well, using a bond market lens

Hedge Funds vs. Bonds

Hedge fund return/risk less bond return/risk, rolling 2 years



Source: Bloomberg. HFRI. October 2013. Volatility based on monthly returns.

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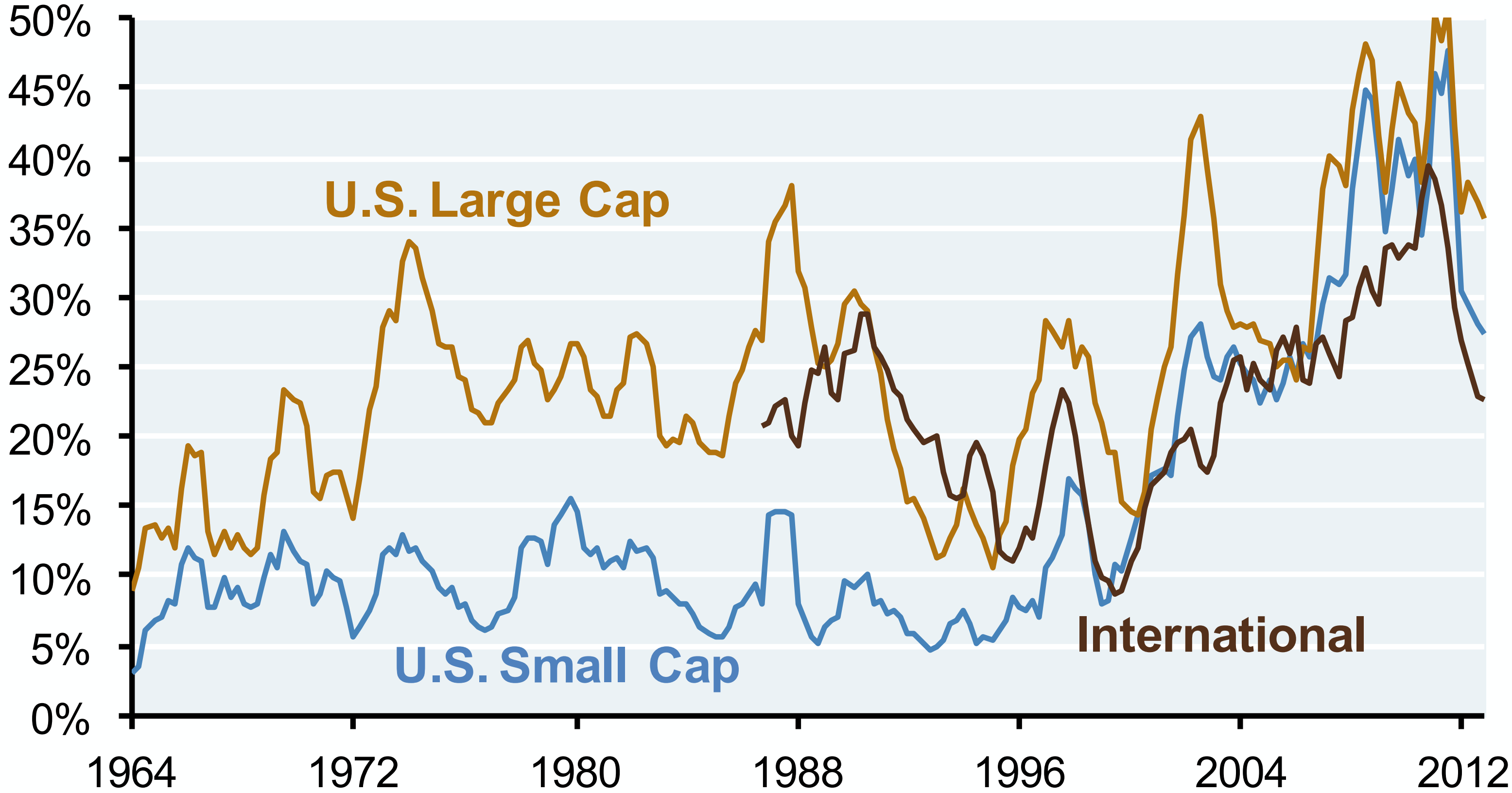
Pair-wise stock correlations falling...

%, 1-year average cap-weighted return correlations



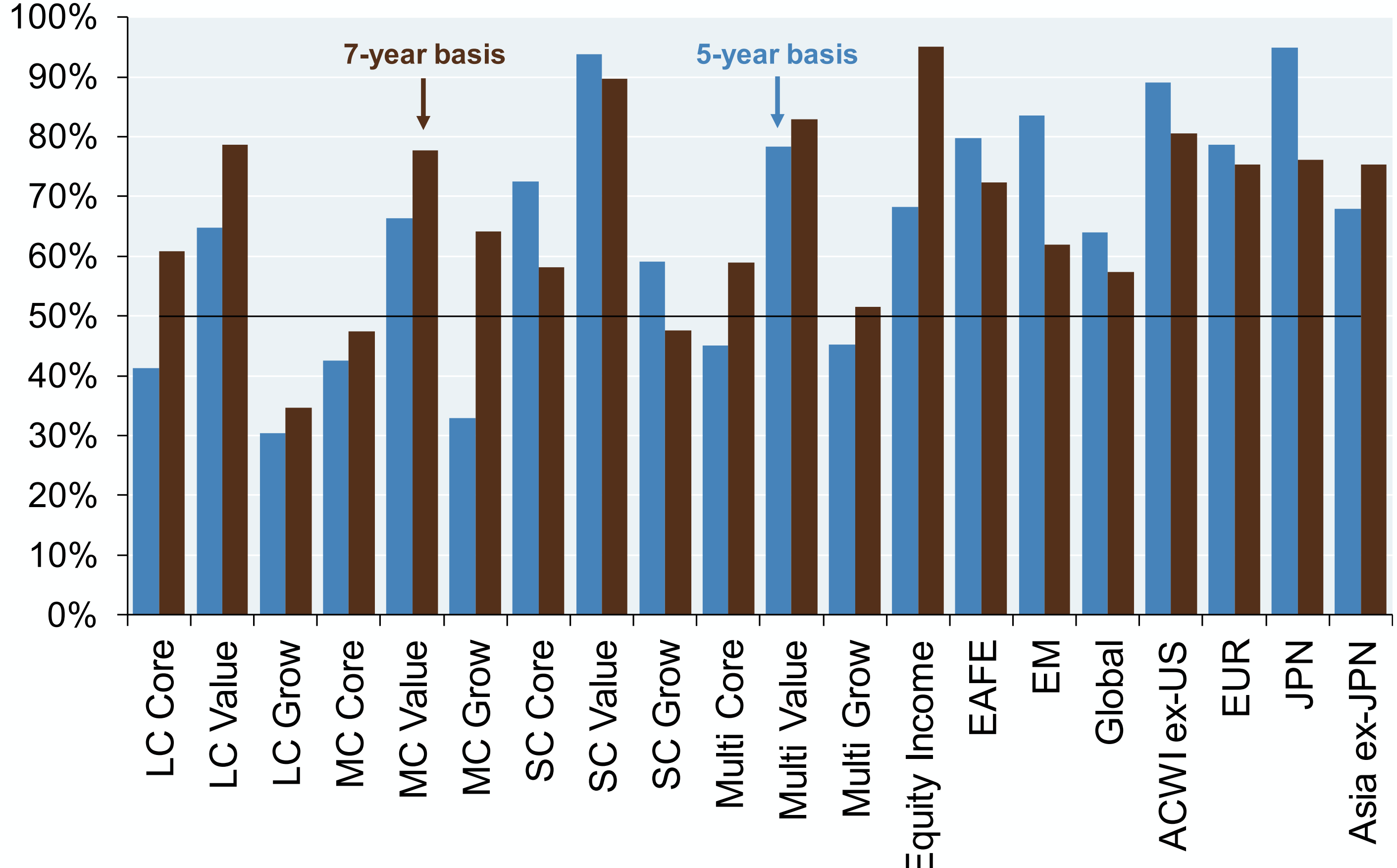
Source: Empirical Research Partners. September 2013.

A search for intelligent life in the active equity management universe

We examined $7+ trillion in global institutional equity assets in separate accounts and commingled funds across 20 asset classes since 1996

Manager outperformance trends have been generally positive over the last 5 and 7 years, except for large cap growth

Generally positive manager outperformance trends over the last 5 and 7 years, with the exception of US LC Growth, % of active managers outperforming their respective investible benchmarks



Source: eVestment, J.P. Morgan Asset Management. September 2013.

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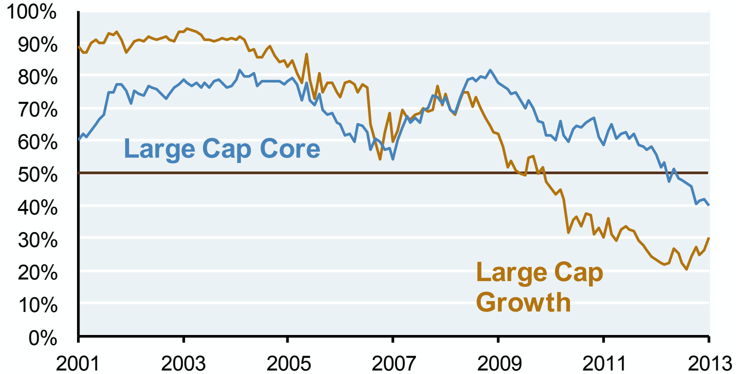
Large cap and mid cap growth are exceptions to the broader trend of outperformance

Large Cap Core and Growth

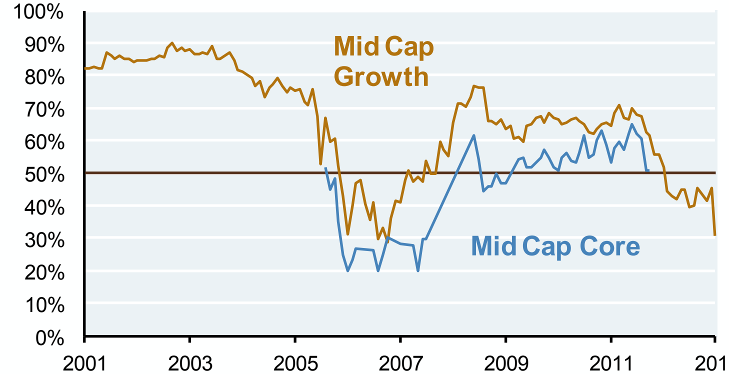
% of funds outperforming ETF, 5-year basis since 1996



Source: eVestment, J.P.Morgan Asset Management. September 2013.

Mid Cap Core and Growth

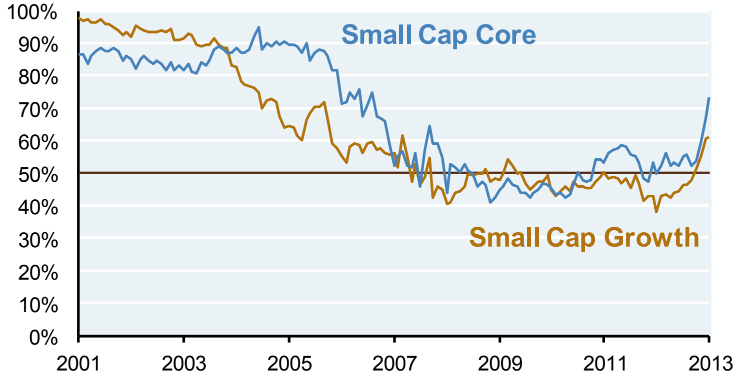
% of funds outperforming ETF, 5-year basis since 1996



Source: eVestment, J.P.Morgan Asset Management. September 2013.

Small Cap Core and Growth

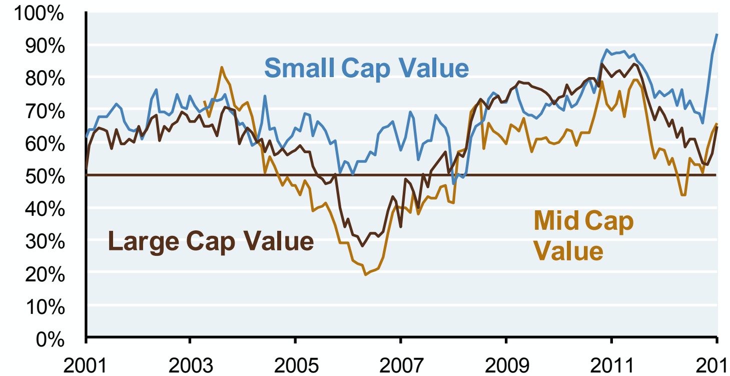
% of funds outperforming ETF, 5-year basis since 1996



Source: eVestment, J.P.Morgan Asset Management. September 2013.

Large Cap, Mid Cap and Small Cap Value

% of funds outperforming ETF, 5-year basis since 1996

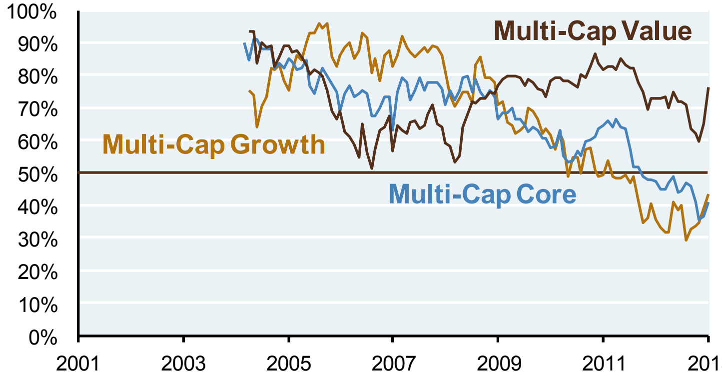


Source: eVestment, J.P.Morgan Asset Management. September 2013.

Outperformance in non-U.S. strategies has been positive

Multi-Cap Core, Value and Growth

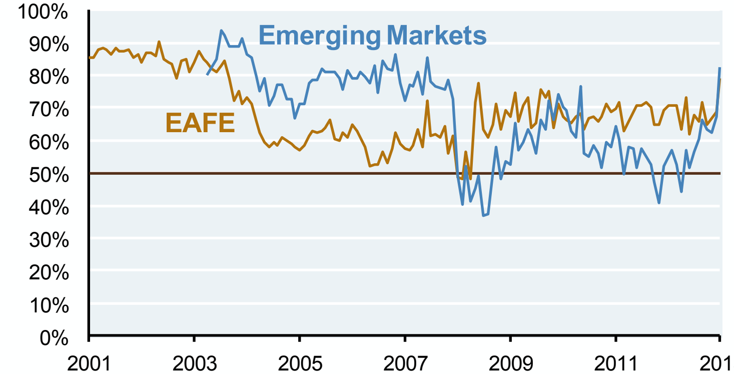
% of funds outperforming ETF, 5-year basis since 1996



Source: eVestment, J.P.Morgan Asset Management. September 2013.

Emerging Markets and EAFE

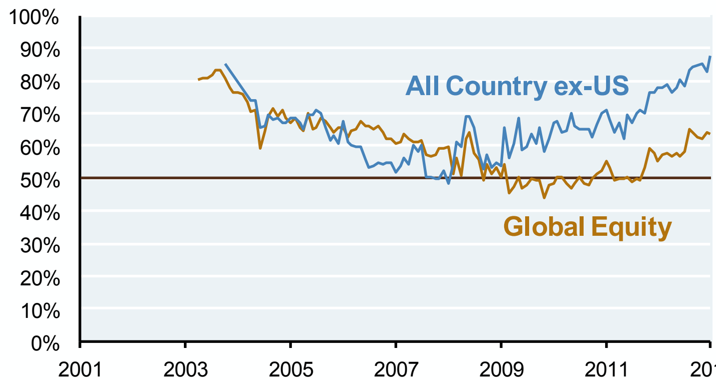
% of funds outperforming ETF, 5-year basis since 1996



Source: eVestment, J.P.Morgan Asset Management. September 2013.

Global Equity and All Country ex-US

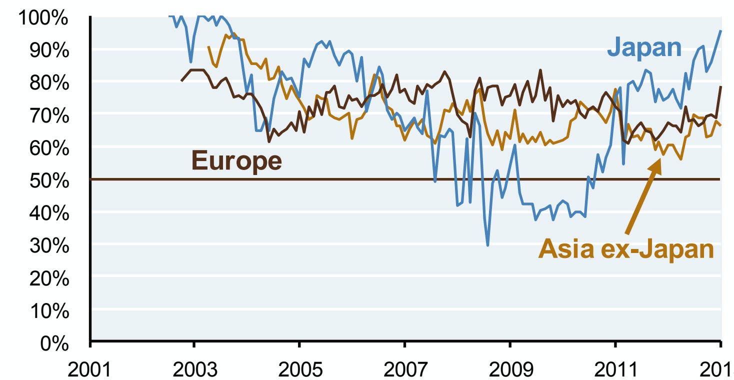
% of funds outperforming ETF, 5-year basis since 1996



Source: eVestment, J.P.Morgan Asset Management. September 2013.

Europe, Japan and Asia ex-Japan

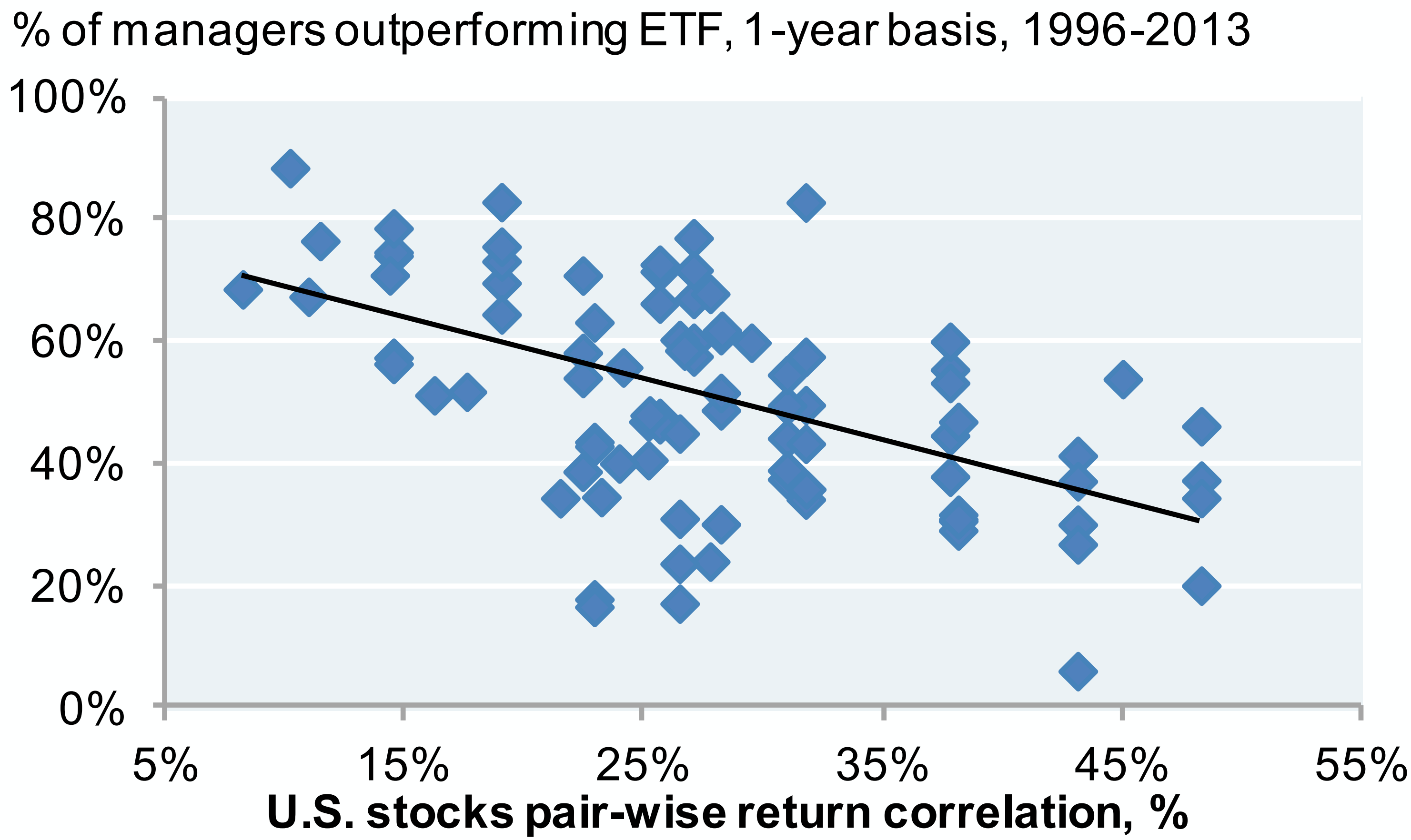
% of funds outperforming ETF, 5-year basis since 1996



Source: eVestment, J.P.Morgan Asset Management. September 2013.

J.P.Morgan Asset Management

Lower correlations have coincided with better manager performance



Source: J.P. Morgan, eVestment, Empirical Research Partners. June 2013.

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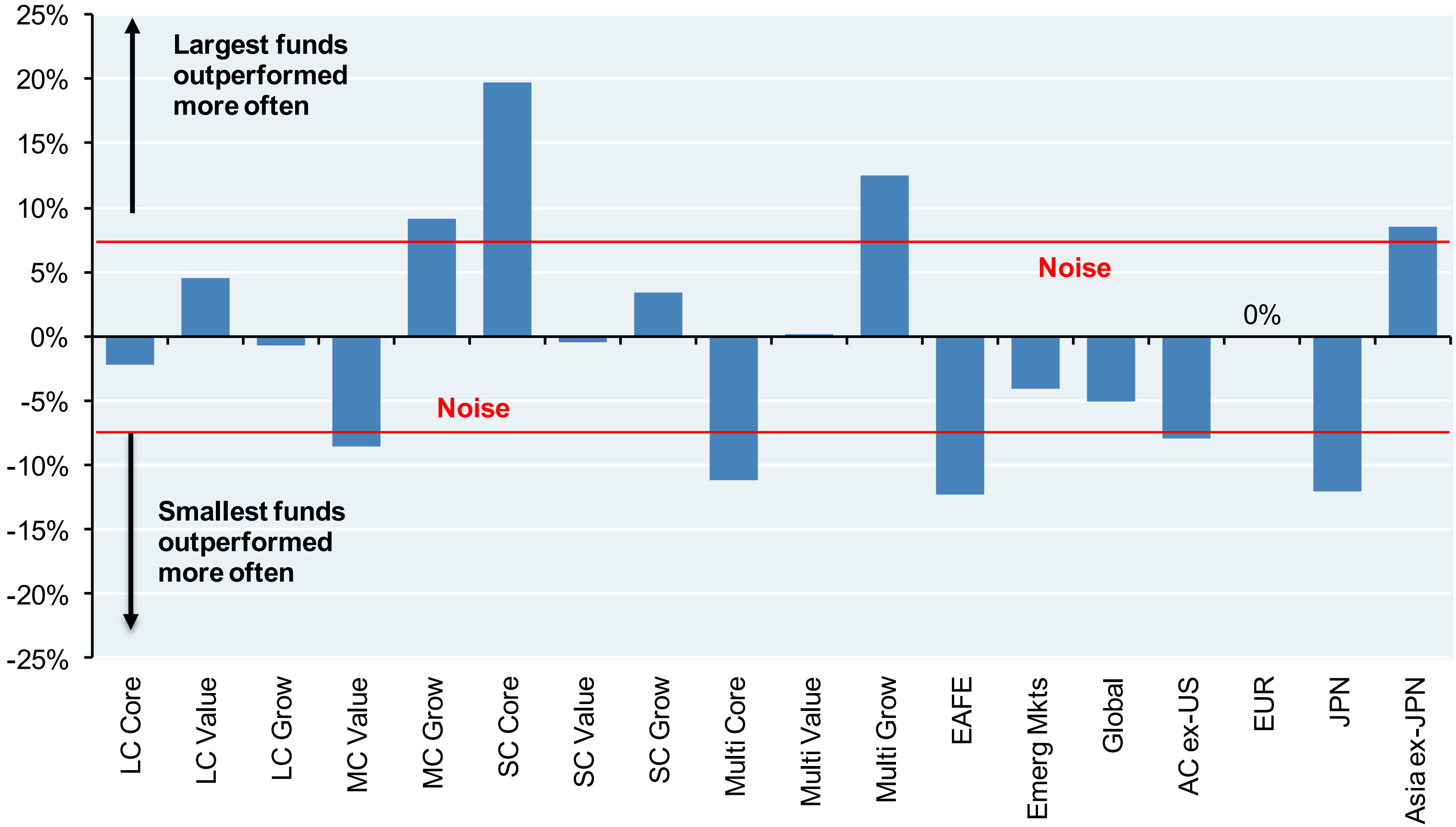
Asset Management

Outperformance not systematically influenced by fund size

Assessing manager outperformance and manager fund size

Outperformance frequency of the largest quartile by fund size minus outperformance frequency of the smallest quartile

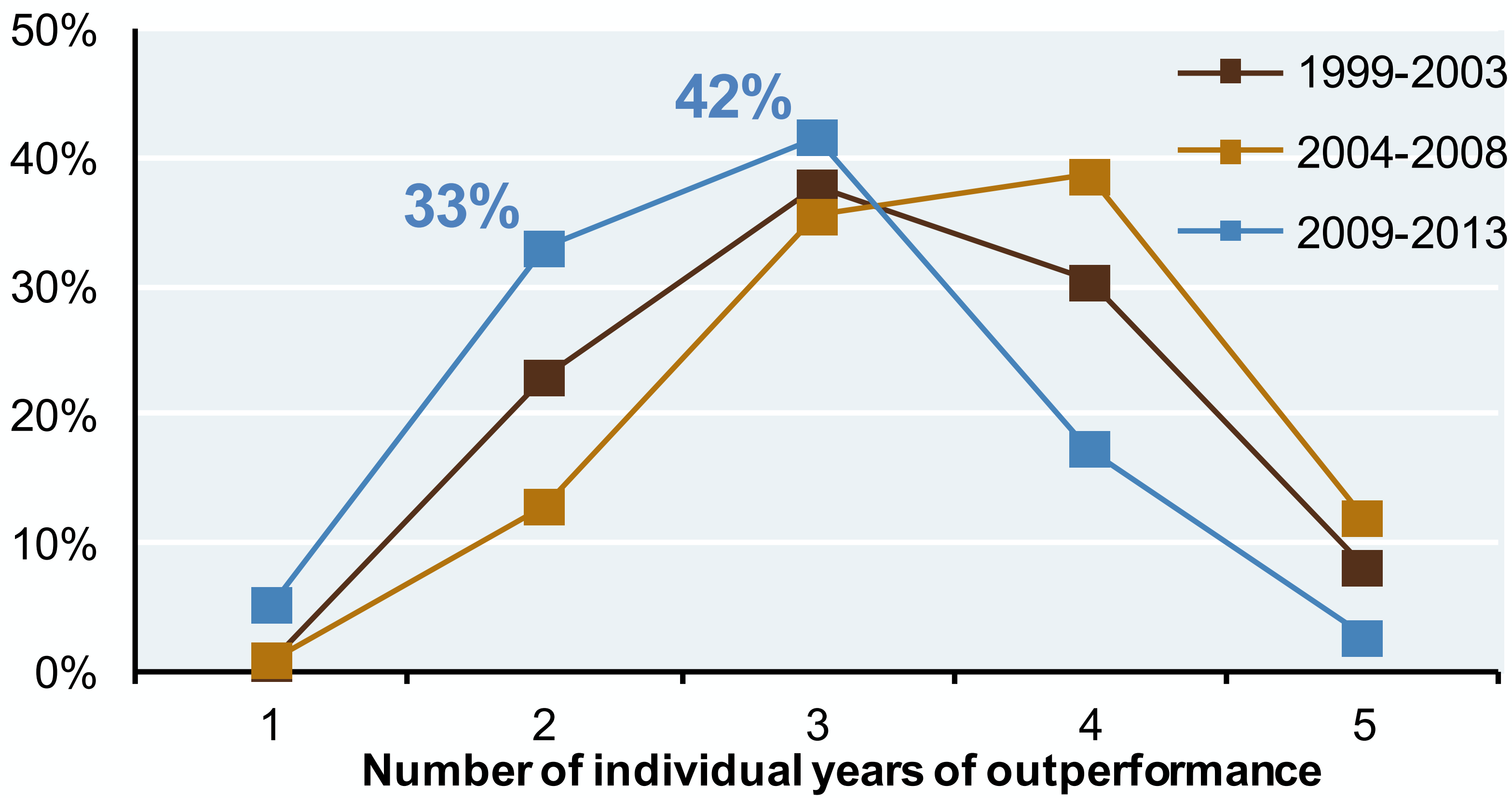


Source: eVestment. J.P. Morgan Asset Management. June 2013. Minimum: 60 managers per observation period.

J.P.Morgan Asset Management

Most "successful" active equity managers experience interim periods of relative underperformance

Frequency distribution of managers outperforming over a 5-year period



Source: eVestment, J.P. Morgan Asset Management. June 2013.

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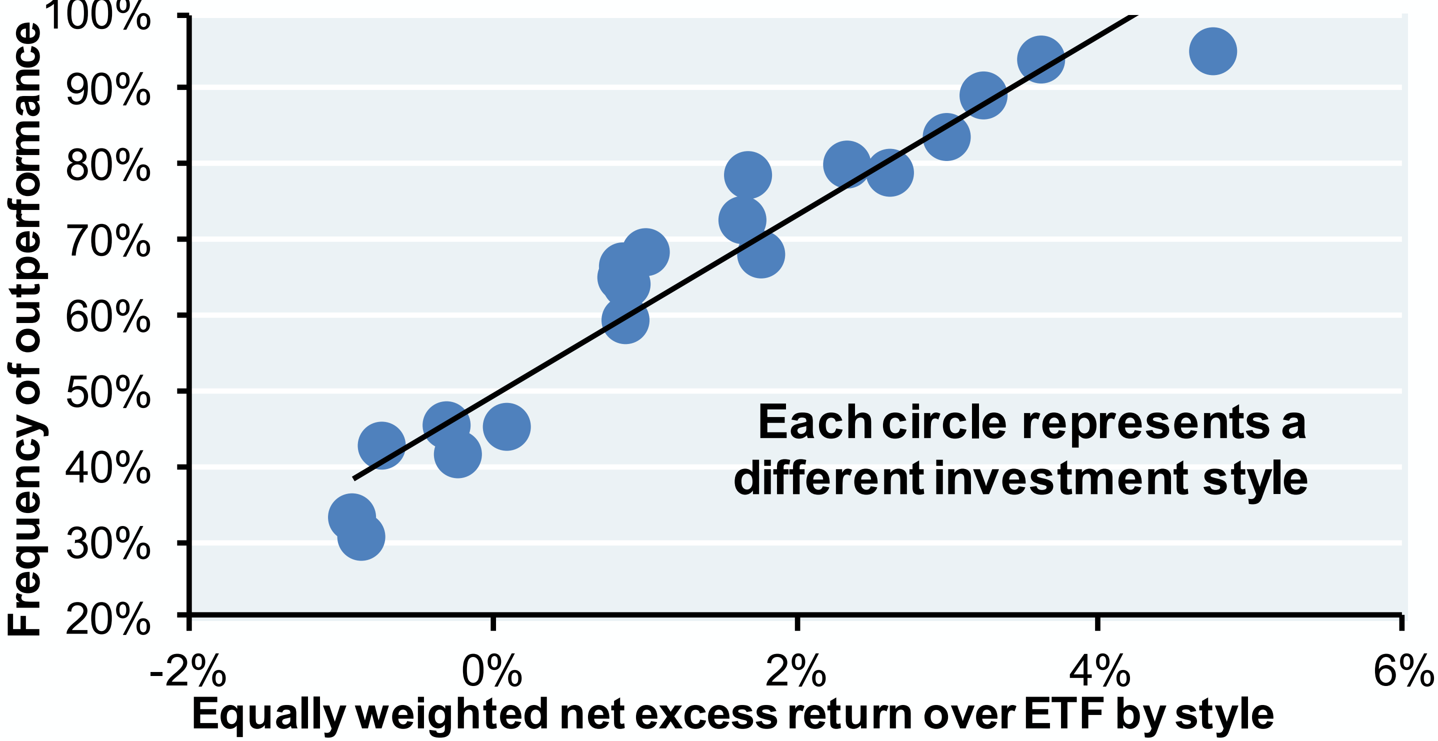
Frequency and degree of manager outperformance roughly proportional

Relationship between outperformance frequency and net excess returns, trailing 5 years



Source: eVestment, J.P.Morgan Asset Management. September 2013.

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Risk-adjusted outperformance generally better than nominal

Frequency of manager outperformance vs. ETF on a nominal and risk-adjusted basis, trailing 5 years

Investment Style	Nominal outperformance (%)	Risk-adjusted outperformance (%)	Difference
Large Cap Core	41%	42%	1%
Large Cap Value	65%	70%	5%
Large Cap Growth	30%	26%	-4%
Mid Cap Core	43%	50%	8%
Mid Cap Value	66%	78%	11%
Mid Cap Growth	33%	41%	8%
Small Cap Core	72%	78%	6%
Small Cap Value	94%	94%	0%
Small Cap Growth	59%	63%	4%
Multi-Cap Core	45%	55%	10%
Multi-Cap Value	78%	74%	-5%
Multi-Cap Growth	45%	37%	-8%
Equity Income	68%	89%	20%
EAFE	80%	87%	7%
Emerging Markets	83%	86%	2%
Global	64%	67%	4%
All Country ex-US	89%	92%	3%
Europe	79%	77%	-2%
Japan	95%	96%	1%
Asia ex-Japan	68%	73%	5%

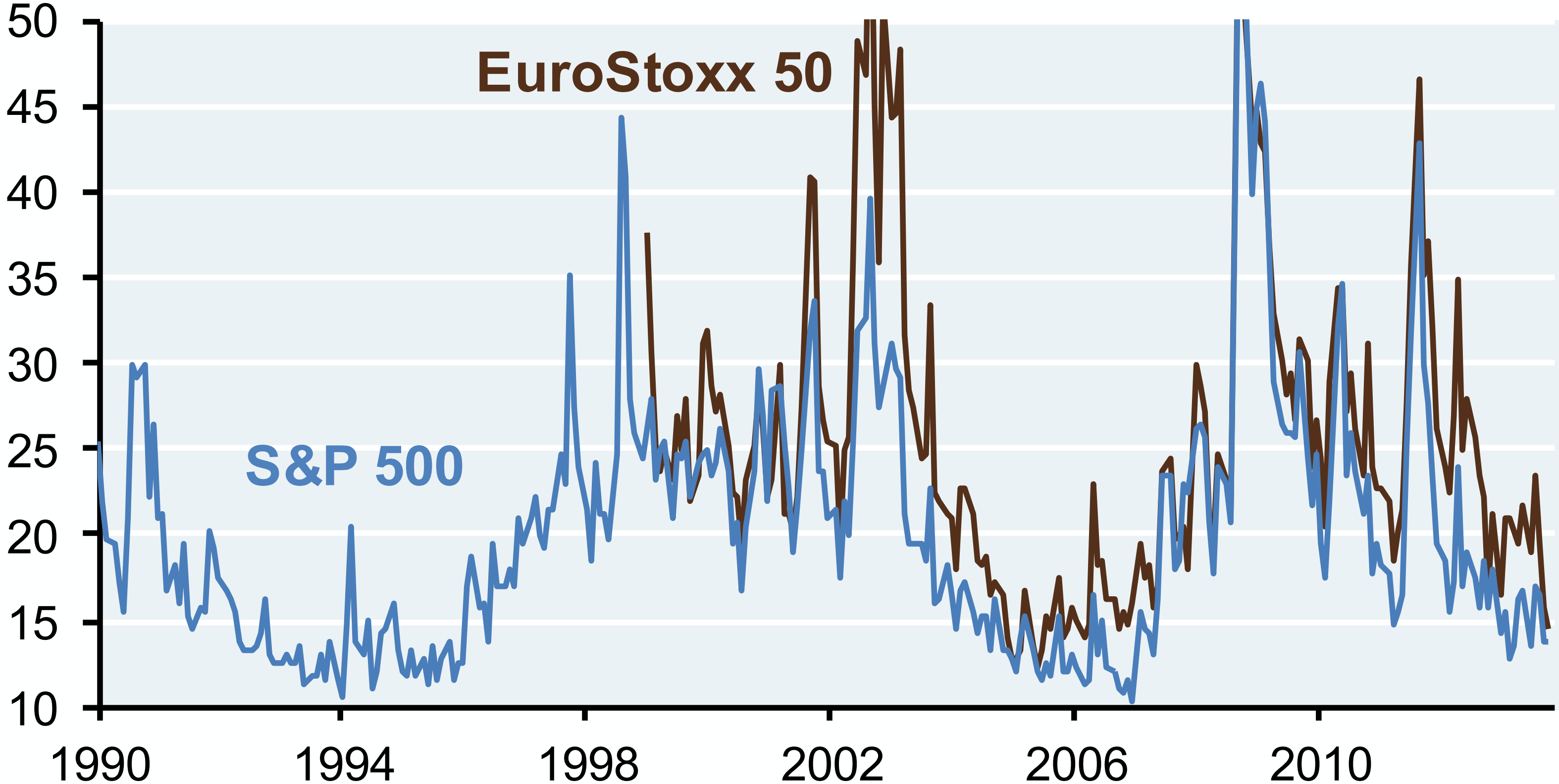
Source: eVestment, J.P.Morgan Asset Management. September 2013.

Based on 5 years trailing performance and fees for $25 mm segregated accounts

Appendix

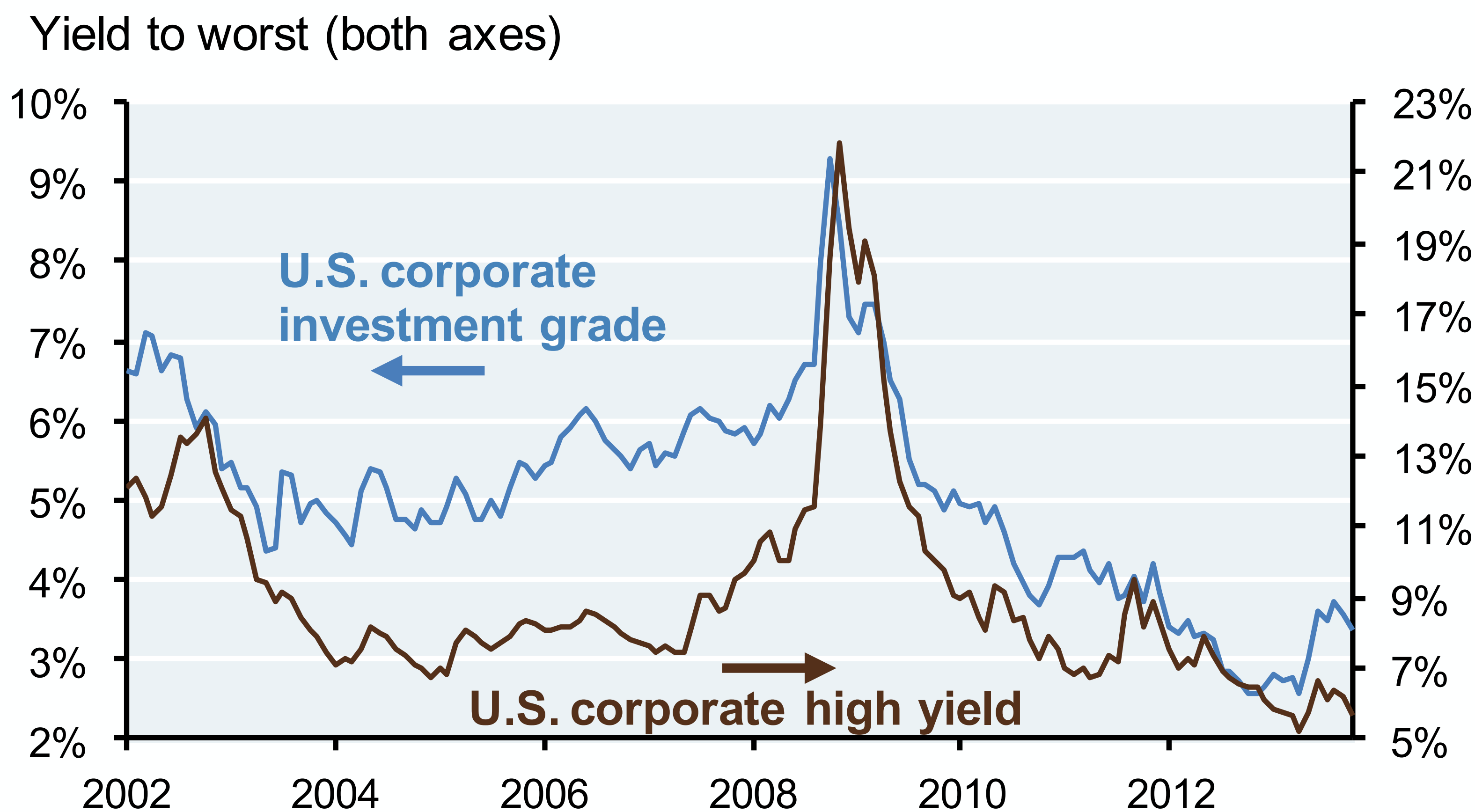
U.S. and European volatility indices

Index



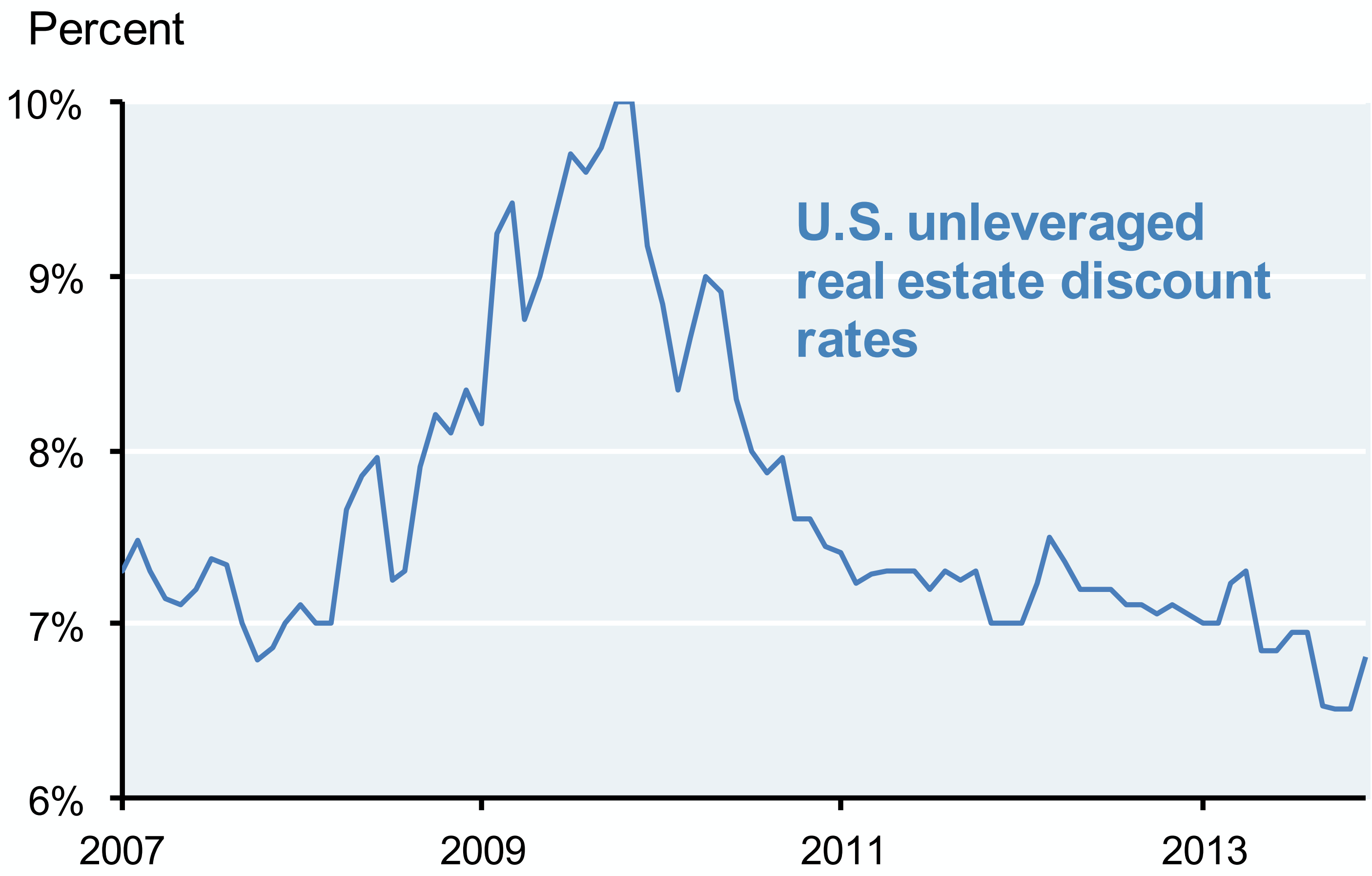
Source: Chicago Board Options Exchange, Bloomberg. November 2013.

U.S. corporate investment grade and high yield bonds



Source: Bloomberg. November 2013.

Discount rates for newly underwritten core real estate transactions



Source: J.P. Morgan Asset Management. November 2013.

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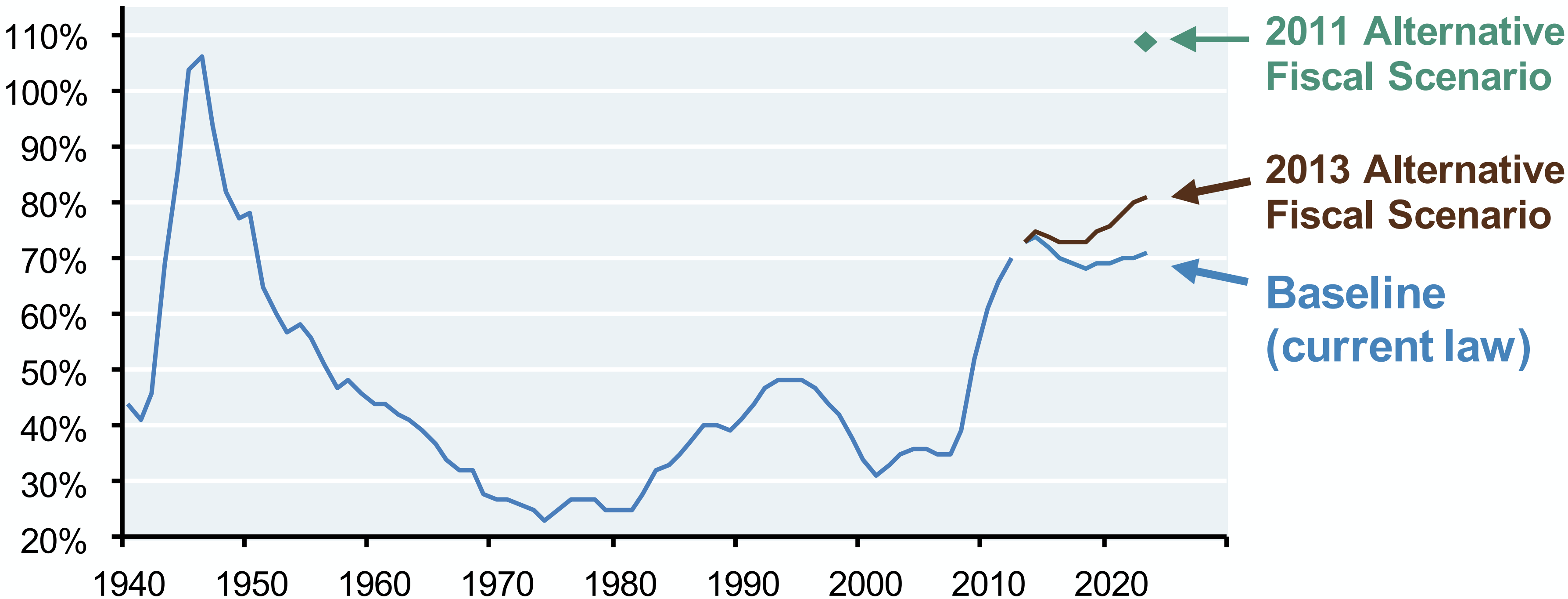
Federal debt held by the public

Percent of GDP



Source: CBO. September 2013.

China's economic slowdown and commodity prices

Source: Bloomberg, China National Bureau of Statistics. December 2013.

J.P.Morgan Asset Management

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MSCI

Kurt Winkelmann, PhD

Managing Director, Head of Risk & Analytical Research

7 World Trade Center

250 Greenwich Street

New York, NY – 10007

United States

+1 212 804 5358

Kurt.Winkelmann@msci.com

Mr. Winkelmann, based in New York, is responsible for setting the firm's research agenda and oversees the efforts of a global team of over 60 researchers across the firm.

Prior to joining MSCI, Mr. Winkelmann was a Managing Director at Goldman Sachs Asset Management where he established and led the Global Investment Strategies team, responsible for strategic asset allocation, asset/liability analysis and risk advisory across asset classes for the firm's major global institutional clients. Between 1993 and 1999, he managed the Global Fixed Income Portfolio Strategy Group at Goldman Sachs International. Mr. Winkelmann's early career also included positions at Vestek Systems and Barra.

Mr. Winkelmann has a PhD and MA in Economics from the University of Minnesota and is an accomplished author and speaker. He has written extensively on investment themes such as risk budgeting and liability-driven investing, and has made numerous board and conference presentations on asset allocation-related themes.

He is a Member of the Board of Trustees for the University of Minnesota Foundation, a Director of the Alberta Investment Management Company, and is Chairman of the Advisory Committee for the University of Minnesota's Heller-Hurwitz Economics Institute. He is a former Director for the University of Minnesota Foundation Investment Advisors.

ARIZONA STATE RETIREMENT SYSTEM

3300 NORTH CENTRAL AVENUE • PO BOX 33910 • PHOENIX, AZ 85067-3910 • PHONE (602) 240-2000
7660 EAST BROADWAY BOULEVARD • SUITE 108 • TUCSON, AZ 85710-3776 • PHONE (520) 239-3100
TOLL FREE OUTSIDE METRO PHOENIX AND TUCSON 1 (800) 621-3778
EMAIL ADDRESS: ASKMAC@AZASRS.GOV • WEB ADDRESS: WWW. AZASRS.GOV

Paul Matson
Director

MEMORANDUM

TO: The Arizona State Retirement System (ASRS) Investment Committee (IC)

FROM: Mr. Paul Matson, Director
Mr. Gary Dokes, Chief Investment Officer (CIO)
Mr. Dave Underwood, Assistant Chief Investment Officer
Mr. Al Alaimo, Portfolio Manager of Fixed Income
Mr. Karl Polen, Head of Private Markets Investing
Mr. Eric Glass, Portfolio Manager of Private Markets

DATE: April 14, 2014

RE: **Agenda Item #4:** Presentation, Discussion, and Appropriate Action Regarding ASRS Investment Program Updates

Purpose
To present and discuss information regarding ASRS investment program updates and Investment Risk Reports.

Recommendation
Informational only; no action required.

Background
As an enhancement to IMD's current reporting structure to the Investment Committee (IC), the CIO and IMD Portfolio Managers will present and facilitate a discussion of the ASRS Investment Program.

The topics listed below are intended to comprehensively cover how ASRS investments are managed, what and why recent strategic/tactical investment decisions have been made and share other information regarding the activities of IMD.

a. ASRS Fund Positioning
b. IMD Investment House Views – April 2014
c. Asset Class Committee (ACC) Activities
d. Tactical Portfolio Positioning
e. Strategic Asset Allocation Policy (SAAP) Implementation
f. IMD Projects, Research and Initiatives

Additionally, the Director reviews with the ASRS Board, on a quarterly basis, the two primary Investment Risk reports IMD uses to help monitor and manage macro-level Total Fund investment risk. These reports along with other portfolio risk and positioning reports provide the CIO with valuable information needed to manage the ASRS Total Fund.

The Director and CIO will discuss the Total Fund, State Street truView Risk Report as well as IMD's Securities Lending Risk Metrics.

Attachments:

From ASRS
- Investment Program Updates Report

From State Street
- truView Risk Report – as of February 28, 2014

From ASRS
- Securities Lending Risk Metrics – as of March 31, 2014

Arizona State Retirement System

Investment Committee

Investment Program Updates

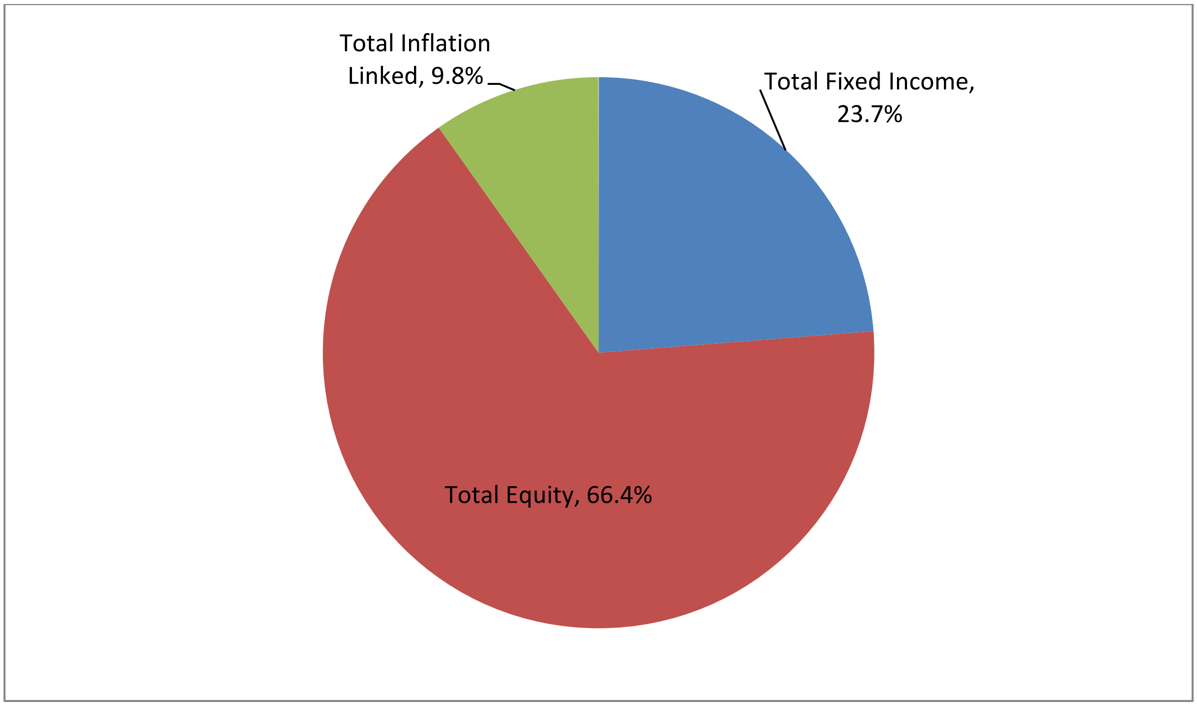
April 21, 2014

Presented by:
Gary R. Dokes, Chief Investment Officer, ASRS
David Underwood, Assistant Chief Investment Officer, ASRS
Karl Polen, Head of Private Markets Investing, ASRS
Al Alaimo, Fixed Income Portfolio Manager, ASRS
Eric Glass, Portfolio Manager of Private Markets, ASRS

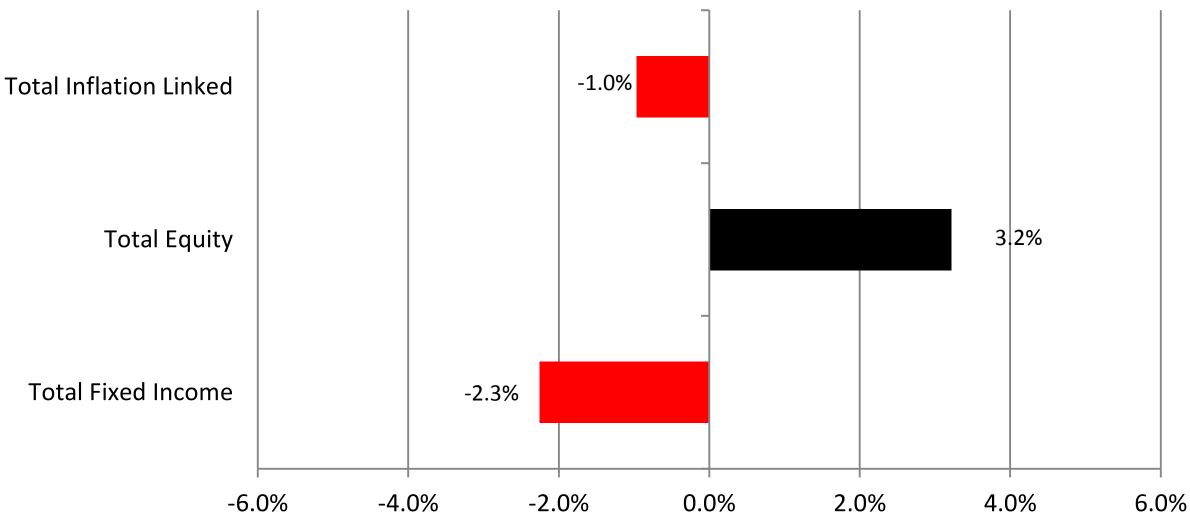
CONTENTS

TOTAL FUND POSITIONING – 3/31/14

ACTUAL PORTFOLIO



ACTUAL PORTFOLIO (ASSUMED GTAA ALLOCATION VS. ADJUSTED SAA POLICY *)



**Real Estate and Private Equity actual weight is equal to policy weight during the implementation of the asset class.*

**Over/Underweights include both GTAA positions as well as IMD tactical considerations.*

Note: Opportunistic & Private Debt, Opportunistic Private Equity, Farmland & Timber, Real Estate and Private Equity market values are reported on a quarter-lag and adjusted to include the current quarter's cash flows. Within the Assumed GTAA Allocation vs. Adjusted SAA Policy chart, Real Estate was prorated to domestic equity, international equity and fixed income. Private Equity was prorated to domestic equity.

Pension (Plan, System, HBS Assets) **ASRS Market Value Report** **As of:** **Monday, March 31, 2014**

Account Manager	Account Manager Style	Fixed Income		Equity		Inflation Linked		Total	Pct of Fund
		Active	Enh/Passive	Active	Enh/Passive	Active	Enh/Passive		
State Street B&T: Boston	Master Cash & Pension Acct.		668,231,933					668,231,933	2.00%
	Cash Total							**$668,231,933**	2.00%
PIMCO: Newport Beach	Active (Core)	301,089,052						301,089,052	0.90%
GTAA Managers (2)	Active GTAA	1,155,569,518						1,155,569,518	3.47%
Blackrock: San Francisco	Passive (Intermediate Gov Credit)		23,569,869					23,569,869	0.07%
ASRS: Phoenix	Enhanced Passive F2		1,940,911,283					1,940,911,283	5.82%
	Core Fixed Income Total							**$3,421,139,723**	10.26%
								Core Fixed Income Policy	**13.00%**
Columbia: Minneapolis	Active	731,783,304						731,783,304	2.20%
Shenkman: Connecticut	Active	172,116,768						172,116,768	0.52%
JP Morgan: Indianapolis	Active	324,226,603						324,226,603	0.97%
	High Yield Fixed Income Total							**$1,228,126,675**	3.68%
								High Yield Fixed Income Policy	**5.00%**
	US Fixed Income Total							**$4,649,266,398**	13.95%
								US Fixed Income Policy Range: 8% - 28%	**18.00%**
PIMCO (local): Newport Beach	Active	336,660,915						336,660,915	1.01%
Ashmore (blended): London	Active	540,667,626						540,667,626	1.62%
	EM Debt Total							**$877,328,541**	2.63%
								EM Debt Policy	**4.00%**
	Opportunistic Debt							**$832,880,904**	2.50%
								Opportunistic Debt Policy Range: 0% - 10%	**0.00%**
	Private Debt Total							**$886,494,747**	2.66%
								Private Debt Policy	**3.00%**
	Fixed Income Total							**$7,914,202,522**	23.74%
								Total Fixed Income Policy Range: 15% - 35%	**25.00%**
Intech: FL	Active (Growth)			514,705,913				514,705,913	1.54%
LSV: Chicago	Active (Value)			784,902,399				784,902,399	2.35%
GTAA Managers (2)	Active GTAA			1,087,871,238				1,087,871,238	3.26%
ASRS: Phoenix	Passive E2				4,763,885,237			4,763,885,237	14.29%
ASRS: Phoenix	Enhanced Passive E7				760,827,680			760,827,680	2.28%
ASRS: Phoenix	Enhanced Passive E8				496,000,067			496,000,067	1.49%
ASRS: Phoenix	Risk Factor Portfolio				487,044,775			487,044,775	1.46%
	Large Cap Equity Total							**$8,896,836,937**	26.69%
								Large Cap Policy	**23.00%**
Wellington: Boston	Active (Core)			431,484,848				431,484,848	1.29%
CRM: New York	Active (Value)			98,061,234				98,061,234	0.29%
ASRS: Phoenix	Passive E3 (Growth)				514,429,035			514,429,035	1.54%
ASRS: Phoenix	Passive E4 (Value)				518,994,907			518,994,907	1.56%
	Mid Cap Equity Total							**$1,562,970,026**	4.69%
								Mid Cap Policy	**5.00%**
TimesSquare: New York	Active SMID (Growth)			511,565,053				511,565,053	1.53%
DFA: Santa Monica	Active (Value)			451,558,755				451,558,755	1.35%
Champlain:Vermont	Active (Core)			114,835,849				114,835,849	0.34%
ASRS: Phoenix	Passive E6				496,209,001			496,209,001	1.49%
	Small Cap Equity Total							**$1,574,168,658**	4.72%
								Small Cap Policy	**5.00%**
	U.S. Equity Total							**$12,033,975,620**	36.10%
								US Equity Policy Range: 26% - 38%	**33.00%**
Brandes: San Diego	Active (Value)			529,903,150				529,903,150	1.59%
Aberdeen: Edinburgh	Active (Value)			498,708,468				498,708,468	1.50%
Hansberger: Ft. Lauderdale	Active (Growth)			337,330,198				337,330,198	1.01%
Walter Scott: Edinburgh	Active (Growth)			231,371,422				231,371,422	0.69%
GTAA Managers (2)	Active GTAA			981,483,893				981,483,893	2.94%
Blackrock: San Francisco	Passive (EAFE)				2,328,667,262			2,328,667,262	6.99%
	Large Cap Developed Non-US Equity Total							**$4,907,488,594**	14.72%
								Large Cap Developed Policy	**14.00%**
AQR: Greenwich	Active (EAFE SC)			177,876,683				177,876,683	0.53%
DFA: Santa Monica	Active (EAFE SC)			225,541,108				225,541,108	0.68%
Franklin Templeton: San Mateo	Active (EAFE SC)			419,961,362				419,961,362	1.26%
Blackrock: San Francisco	Passive (EAFE SC)				463,059,640			463,059,640	1.39%
	Small Cap Developed Non-US Equity Total							**$1,286,446,446**	3.86%
								Small Cap Developed Policy	**3.00%**
William Blair: Chicago	Active (EM)			436,362,182				436,362,182	1.31%
Eaton Vance: Boston	Active (EM)			483,504,382				483,504,382	1.45%
LSV: Chicago	Active (EM)			286,004,531				286,004,531	0.86%
Blackrock: San Francisco	Passive (EM)				648,915,959			648,915,959	1.95%
	Emerging Markets Equity Total							**$1,854,787,054**	5.56%
								Emerging Markets Policy	**6.00%**
	Non-US Equity Total							**$8,048,722,094**	24.15%
								Non-US Equity Policy Range: 16% - 28%	**23.00%**
	Private Equity Total							**$1,871,081,318**	5.61%
								Private Equity Policy Range: 5% - 9%	**7.00%**
	Opportunistic Equity							**$190,723,503**	0.57%
								Opportunistic Equity Policy Range: 0% - 3%	**0.00%**
	Equity Total							**$22,144,502,536**	66.43%
								Total Equity Policy Range: 53% - 73%	**63.00%**
Gresham: New York						845,513,408		845,513,408	2.54%
GTAA Managers (2)	Active GTAA					323,447,378		323,447,378	0.97%
	Commodities Total							**$1,168,960,786**	3.51%
								Commodities Policy Range: 1% - 7%	**4.00%**
GTAA Manager (1)	Active GTAA					44,113,440		44,113,440	0.13%
	Real Estate Total							**$2,012,879,240**	6.04%
								Real Estate Policy Range: 6% - 10%	**8.00%**
	Infrastructure Total							**$0**	0.00%
								Infrastructure Policy Range: 0% - 3%	**0.00%**
	Farmland & Timber Total					92,404,140		**$92,404,140**	0.28%
								Farmland & Timber Policy Range: 0% - 3%	**0.00%**
	Opportunistic Inflation Linked Total							**$0**	0.00%
								Opportunistic I/L Policy Range: 0% - 3%	**0.00%**
	Inflation Linked Total							**$3,274,244,166**	9.82%
								Inflation Linked Policy Range: 7%-15%	**12.00%**
	TOTAL Amounts	$4,448,608,533	$3,465,593,989	$10,664,869,344	$11,479,633,192	$3,366,648,306	$0	**$33,332,949,224**	**Total Fund**
	TOTAL Percent	13.35%	10.40%	31.99%	34.44%	10.10%	0.00%		

Asset Class	Actual Portfolio	SAA Policy: Target (Range)	Rebalancing Assumed Port	Rebalancing Adj Policy	Assumed - Adjusted % diff	Assumed - Adjusted $ diff	Policy Band check Actual - Adj	Passive Min	Passive Actual
Cash	2.00%								
Core	10.26%	13%						50%	60%
High Yield	3.68%	5%							
US Fixed Income	13.95%	18% (8-28%)	15.50%	18.55% (9-29%)	-3.05%	-$1,015,157,992	OK		
EM Debt	2.63%	4%		4.00%					
Opportunistic Debt	2.50%	0% (0-10%)	2.50%	0% (0-10%)	2.50%	$832,880,904	OK		
Private Debt	2.66%	3%		3.00%					
Total Fixed Income	**23.74%**	**25% (15-35%)**	**23.29%**	**25.55% (16-36%)**	**-2.26%**	**-$751,760,246**	**OK**		
Large Cap	26.69%	23%							
Mid Cap	4.69%	5%							
Small Cap	4.72%	5%							
US Equity	**36.10%**	**33% (26-38%)**	**37.47%**	**35.23% (28-40%)**	**2.24%**	**$747,659,381**	**OK**	**50%**	**64%**
Developed Large Cap	14.72%	14%							
Developed Small Cap	3.86%	3%							
Emerging Markets	5.56%	6%							
Non-US Equity	**24.15%**	**23% (16-28%)**	**23.90%**	**23.49% (16-28%)**	**0.41%**	**$135,342,071**	**OK**	**30%**	**43%**
Private Equity	5.61%	7% (5-9%)	5.61%	5.61% (4-8%)	0.00%	$0	OK		
Opportunistic Equity	0.57%	0% (0-3%)	0.57%	0% (0-3%)	0.57%	$190,723,503	OK		
Total Equity	**66.43%**	**63% (53-70%)**	**67.55%**	**64.33% (54-71%)**	**3.22%**	**$1,073,724,956**	**OK**		
Commodities	3.51%	4% (1-7%)	2.97%	4.08% (1-7%)	-1.11%	-$370,255,410	OK		
Real Estate	6.04%	8% (6-10%)	5.91%	6.04% (4-8%)	-0.13%	-$44,113,440	OK		
Infrastructure	0.00%	0% (0-3%)	0.00%	0% (0-3%)	0.00%	$0	OK		
Farmland & Timber	0.28%	0% (0-3%)	0.28%	0% (0-3%)	0.28%	$92,404,140	OK		
Opportunistic I/L	0.00%	0% (0-3%)	0.00%	0% (0-3%)	0.00%	$0	OK		
Total Inflation Linked	**9.82%**	**12% (8-16%)**	**9.15%**	**10.12% (6-14%)**	**-0.97%**	**-$321,964,710**	**OK**		
Total	**100.00%**	**100%**	**100.00%**	**100.00%**	**0.00%**	**$0**		**30%**	**40%**
								Internally Managed Portfolios:	
Total GTAA								**$9,491,257,212**	**28%**
Bridgewater	$3,006,649,615	9.0%					**Opportunistic definitions:**		
Windham	$585,835,853	1.8%					1) Tactical in nature: Function of market dislocation AND		
Total	**$3,592,485,467**	**10.8%**					2a) Outside SAA benchmark, OR		
Policy	**10% ±5%**	**OK**					2b) Within SAA benchmark but absolute return oriented		

(Notable changes from the previous month are highlighted in RED)

APRIL 2014

U.S. EQUITIES

Primary Market Metrics & Indicators:

1. Fundamentals: **POSITIVE**
   - Major risks have receded and economic data suggests stable, sub-trend growth into 2014.
   - Persistently high U.S. unemployment raise questions about a sustainable recovery, but no other tailspin issues have surfaced.
   - At risk longer term due to stimulus measures; inflation remains generally subdued.
   - There is considerable liquidity; Federal Reserve policy remains accommodative.
   - Overall U.S. corporate profits are still growing, but with decelerating momentum as revenue trends are flat and pressures on profit margin expansion are surfacing.

2. Valuations: **NEUTRAL (from POSITIVE)**
   - P/E ratios (forward) are now less generous, and marginally less so for the mid- and smaller-sized companies: S&P 500, 16.6x-19.4x, S&P MID, 15.8x-18.1x; S&P SC600, 17.1x-20.7x..
   - Historic P/Es imply advances of 5-10% for mid and small caps; 9-12% for S&P 500.
   - Still rising earnings and low yields on 10-Yr Treasury notes combine for equity risk premiums that are favorably above the 4.0% long-range average for large caps, but market advances have trimmed those of mid- and small-caps to near 3.0%.

3. Sentiment: **POSITIVE**
   - Lessened near-term equity market volatility (i.e., VIX Index) still reflects growing acceptance of risk-oriented assets.
   - Asset flows that had gone to bonds and non-U.S. equities until 2013 continue to shift toward equities, though not necessarily to stock mutual funds

Commentary:

Staff continues to systematically pare back the allocation to U.S. stocks, proportionally more so from the midcap and small-cap sub-classes. Strong price advances have outpaced earnings growth in these categories to the extent that their short-run risk premiums are less compelling. This has also been reflected in the waning performance of small-cap stocks *relative* to large-cap counterparts; over 1Q2014, both categories advanced, but small-caps rose by less than large-caps.

Though domestic equity market valuations are being stretched this does not suggest that they have reached over-extended, bubble-like levels; only that investors have re-rated valuations to the richer end of a more normalized range. This drives our "*Neutral*" opinion on valuations. Some correction in pricing, well short of a precipitous rout, is to be expected until the level of corporate profits notches sufficiently higher to enrich risk premiums. Portfolio rebalancing and profit-taking are normal and prudent activities after advances such as those experienced over the past year. Methodical buying of stocks once price corrections run their course is equally prudent. The reductions in our U.S. equities allocations adhere to those disciplines.

Apart from shifting a portion of U.S. assets to the EAFE asset sub-class of Non-U.S. equities late in 4Q2013, domestic equities has primarily been the funding source to meet both internal and external cash-flows. Demands elsewhere in Total Fund notwithstanding, staff anticipates reallocating additional assets opportunistically from U.S. Equities to the developed markets sub-class Non-U.S. Equities.

CURRENT PORTFOLIO POSTURE: Overweight vs. SAA target

NON – U.S. EQUITIES

Primary Market Metrics & Indicators:

1. Fundamentals: **POSITIVE**
    - GDP growth in the Eurozone has begun to look less recessional while that of the lesser-developed economies remains off its pace, but comparatively stronger.
    - Relatively inexpensive and available money supports a shift toward risk assets.
    - Monetary and economic policies are focused on controlling economic growth and fiscal stability.

2. Valuations: **POSITIVE**
    - Reasonable global valuations relative to U.S.; price-to-book values of 1.5x - 1.9x; P/Es of 13.5x – 15.2x on trend earnings.
    - Dividend yields are incrementally more favorable with most ranging from 1.5x to 1.6x that of the S&P500.

3. Sentiment: **POSITIVE**
    - Money flows continue toward both U.S. and non-U.S. equities; accepting the emerging economies markets, investors are less guarded and remain constructive on global risks.
    - Major non-U.S. markets performances are keeping pace with those of the U.S.

Commentary:

Global equities markets appear to have interpreted the near-term peaking of macroeconomic momentum as a rollover of GDP growth rather than the plateauing that is taking place and thus have discounted equities accordingly. Excess liquidity is supportive for re-rating equity risk premiums. Earnings of European corporations are still on trend for a 12-13% rate of growth this year, roughly half again faster than that expected for U.S. counterparts. Equity risk premiums of over 5%, besides outweighing those of U.S. stocks, offer ample compensation for investment.

From a fundamental standpoint, inventory levels of European corporations are at cyclically low levels and new orders indicators point to a production upturn and export-led growth. Anecdotal reports have indicated that there is some concern about the potential impact of China's economic slowdown on Europe, but that may be overdone. In fact, exports to China have already slowed but aren't decelerating further and demand is increasing from other importers.

The Japanese equities markets continue to be challenged after responding well earlier in 2013. Japanese economic reform continues, but the markets are waiting for follow-on to the Abe policies. The solid gains in personal consumption from the spurt of income growth appear vulnerable to a new round of taxes.

Emerging markets (EM) overall, are enigmatic. Having undergone two years of price correction, valuations for the most part remain attractive as compared to those of the developed economies. But an inherent “value trap” persists, as economic fundamentals continue to shift about for the larger countries, weaken for those with large external debt balances yet are surprisingly solid for many others. Not surprisingly, capital continues to be withdrawn indiscriminately from EM equity markets, despite select opportunities at the specific company level.

IMD moved equities positioning in late 4Q2013 to a more neutral allocation to both the U.S. markets asset class, and to the Non-U.S. developed-economies equities class, and expects to increase the Non-U.S. exposure opportunistically over the course of 2014.

CURRENT PORTFOLIO POSTURE: Approx. Equal Weight vs. SAA target

FIXED INCOME

Primary Markets Metrics & Indicators:

1. Fundamentals: **NEUTRAL**
   - Over the past few years, fundamentals in the fixed income markets have been dominated by an extremely accommodative monetary policy by the Federal Reserve. This has included massive, unprecedented bond buying programs of both treasury bonds and agency MBS securities known as “quantitative easing” that began in 2009 during the credit crisis and continues to this day. The Fed has now gradually begun to reduce its monthly purchases with a potential complete cessation of bond buying by the end of this year. In addition, the Fed has pledged to keep short-term rates near zero over an extended time depending on select economic targets and conditions. While these policies have kept interest rates artificially low, the potential cessation of bond buying activities along with an improving U.S. economic outlook could lead to higher interest rates over an intermediate to long-term time frame.
   - In the near-term, long-term interest rates have fallen in 2014 in response to a combination of factors including some disappointing economic data and concerns about growth in China and other emerging markets.

2. Valuations: **NEGATIVE**
   - The core fixed income market is relatively unattractive due to low overall yields as Treasury rates remain at low levels, investment-grade credit spreads are relatively tight and spreads on agency MBS are somewhat compressed due to aggressive buying by the Fed. Ultimately, we believe the Fed will end its aggressive bond buying, and Treasury rates will rise over the intermediate-term from artificially low levels in the current market. That being said, core fixed income remains a safe haven in times of market turbulence and tends to perform well when risky assets such as equities sell off.

- With a benign outlook for corporate defaults and an overall demand in the market for yield, the valuation of high yield bonds has substantially compressed since mid-2012. As a result, the market has lost much of its return potential relative to prior years and will likely achieve low to mid-single-digit returns over the coming year.
- While emerging market debt denominated in local currencies offers attractive yields, the weak performance of emerging market currencies relative to the U.S. dollar has resulted in very poor performance of this market over the past year. Furthermore, a combination of global economic factors has raised the possibility of a continuation of poor returns this year. Of most concern is the potential for a sustained period of US dollar appreciation as has occurred periodically in the past (such as the 1990's) that could adversely affect the returns of EM local currency debt going forward.
- Private debt offers the most attractive opportunity in the fixed income markets with double-digit yields readily available for investors willing to accept illiquidity.
- Select areas of opportunistic debt such as distressed debt (both corporate and structured credit) and excess mortgage-servicing rights ("MSRs") also offer opportunities to potentially achieve double-digit returns.

3. Sentiment: **NEUTRAL**

- Following a multi-decade period of declining interest rates, IMD has modest concerns that investors sentiment is shifting away from fixed income. That being said, going forward, IMD believes demand will continue for income producing assets particularly those which offer a yield premium.

Commentary:

IMD remains underweight in its overall fixed income target due to the relatively low yields offered in the public fixed income markets as well as the risk of potentially higher treasury rates. ASRS is currently underweight in its SAAP target for core fixed income, high yield and emerging market debt. While core fixed income offers important defensive characteristics to potentially balance out the overall risks of the total fund portfolio, low levels of U.S. Treasuries and generally tight spreads in the investment-grade bond markets make it generally unattractive.

Furthermore, IMD remains concerned about the potential for higher Treasury rates and the impact on returns for core fixed income, should the Fed completely end its quantitative easing programs. In high yield, which historically is less sensitive to higher interest rates, spreads have compressed to levels which make potential returns much less compelling than in prior years. In emerging market debt, we are concerned about the potential for continued poor performance in this asset class due to risk of a potentially stronger US dollar.

IMD sees the most attractive opportunities in fixed income in select credit markets -- particularly private debt and opportunistic debt -- where compelling yield and total return opportunities exist. Opportunistic debt includes a number of mandates such as distressed debt and structured asset-backed securities that are likely to provide very attractive returns. Since December, we have established two new multi-strategy mandates with strategic partners in opportunistic debt to take advantage of potential investment opportunities as European banks disgorge troubled fixed income assets.

CURRENT PORTFOLIO POSTURE: UNDERWEIGHT vs. SAA target

REAL ESTATE

Primary Market Metrics & Indicators:

1. Fundamentals: **POSITIVE**
   - While vacancy is declining across the board, excess inventory remains a problem in some sectors especially retail and suburban office.
   - Our review of property market fundamentals leads to emphasize apartments, industrial properties, medical office buildings, senior housing self-storage, and student housing in our current investing efforts for demographic and macro policy reasons.
   - There are relatively few foreclosures on high quality property, but there continues to be pressures on refinancing of legacy leverage structures and we participate in those transactions through several of our manager relationships.
   - Single family housing has turned the corner with effects rippling through the economy. Recovery in construction and NOI has been led by apartments to date.
2. Valuations: **NEUTRAL**
   - On a total market basis, valuations have recovered from recession lows but are still about 15% below prior peak. However, coastal markets have rebounded more strongly than interior markets.
   - High quality coastal market properties are trading at historic low cap rates; however these cap rates still reflect approximately a normal spread to treasury. The financing market for assets of this quality has recovered and supports these valuations by providing fixed rate financing that mitigates the risk of later cap rate expansion. International investors looking for safe assets have contributed to demand in the coastal markets.
   - Recent increases in treasury rates do not appear to have affected commercial real estate valuations. Many observers believe that ~100bps of rate increase was already discounted into cap rates.
   - REITs are trading at a 4% premium to NAV with an average dividend yield of 3.9%. This reflects a 123bps spread to the 10 year treasury, which is a bit higher than the historical average of 108bps.
3. Sentiment: **POSITIVE**
   - U.S. focused real estate fund raising rose 13% to $76 billion per year. U.S. focused dry powder has trended down to approximately $80 billion.
   - Global commercial real estate transaction volume peaked at around $700 billion in 2007, but dropped to about a third of that during the global financial crisis. Current volume of approximately $550 billion is double the recession trough, but still well below the peak.
   - Debt availability has improved considerably since the depth of the recession, but is still tight by historic standards for all but the most desirable properties. Construction financing remains a considerable challenge, even for well justified projects.

Commentary:

IMD continues to implement its separate account real estate strategic manager program. ASRS adopted an updated pacing and implementation plan in December, calling for $500 million in new commitments in 2014 including $350M allocated to niche and tactical opportunities.

CURRENT PORTFOLIO POSTURE: UNDERWEIGHT * vs. SAA target *in program funding/build-out phase

PRIVATE EQUITY

Primary Market Metrics & Indicators:

1. Fundamentals: **POSITIVE**
   - The U.S. economy continues to show steady improvement.
     - ◊ The energy sector is dynamic with massive new investment in "tight oil" and related infrastructure and services, with supply improvements also resulting in improved energy efficiency particularly of benefit to manufacturers.
     - ◊ Healthcare is being reshaped to implement the requirements of "Obamacare"
     - ◊ The U.S. continues to be a global leader in technology innovation.
   - Europe continues to struggle in recovering from the financial crisis although recent data suggests a pickup in economic activity. Its problems are exacerbated by a unified currency without unified fiscal policy and it is expected to experience a very slow recovery.
   - Emerging markets have slowed while the largest emerging markets are transitioning to focus on domestic consumption.

2. Valuations: **NEUTRAL**
   - Purchase price multiples in 2013 (through Q3) were 8.4x, roughly flat from 2012 levels and below 2007 peak valuations. Over the course of 2013, large deal mutliples rose from 10x to 11x while small deals fell from 4.0x to 2.5x.
   - The leveraged loan and high yield debt markets were active in 2013 reaching multi-year highs for net issuance, albeit principally for refinancing. Single B leveraged loan and high yield spreads have recently dipped below 400bps.
   - Total leverage in 2013 (through Q3) ticked up to 5.3x from 5.1x in 2012, although still down ~0.8x turn from the 2007 peak.

3. Sentiment: **NEUTRAL**
   - Globally, fund raising was up from $381B (1,035 funds) closed 2012 to $454B (873 funds) closed in 2013. In aggregate, there are 2,000+ funds currently seeking ~$800B. In North America fund raising was up from $201B (475 funds) closed 2012 to $288B (487 funds) closed in 2013.
   - Dry powder of nearly $1.0 trillion globally in all categories rose from $941 at the end of 2012.
   - In 2013, PE deal flow fell 10% globally while the aggregate value of deals was up 10% in N. America, down 6% in Europe, and down 28% in Asia.
   - In 2013 there were 1,300+ exits valued at $300B, the highest count on record and matching the value of 2011. The average exit size of $500M was the same as 2012.
   - The IPO market continued to trend up in 2013 (particularly in H1) as equity markets rallied.

Commentary:

Areas of emphasis are U.S middle market buyout with focus on managers with strong operational capability. Vertical strategies in energy, healthcare and technology are under consideration. IMD will reduce emphasis on large buyout strategies though larger managers with specialized deal flow remain of interest. IMD will continue to monitor Europe for a favorable reentry point. IMD's pacing plan calls for $550M in commitments for 2014, with an additional $50M carried over from 2013.

CURRENT PORTFOLIO POSTURE: UNDERWEIGHT * vs. SAA target*in program funding/build-out phase

COMMODITIES

Primary Market Metrics & Indicators:

1. Fundamentals: **NEGATIVE**
   - The Fed continued to taper its QE program by $10B per month and reiterated that inflation was not a significant concern.
   - Recent data indicates the US economy has momentum, although the winter weather has impeded progress. Excluding exogenous factors, most commodity sectors appear well supplied, particularly for the current global slow growth environment.
   - After a strong harvest season, Ags will turn their attention to the upcoming planting season. Energy markets reflect the continued growth in US production, although cold winter weather and geopolitical events in Ukraine/Russia have kept prices up. Metals have been mixed as precious metals have benefitted from a flight to safety while industrial metals still exhibit weak demand.
2. Valuations: **NEUTRAL**
   - After being range bound from 245 – 260 in 2H 2013, the index has risen to 270.
   - Year-to-date, coffee, hogs, wheat have been the leaders with copper, lead, and aluminum being the biggest laggards.
   - The index on a year-to-date basis is up 7%, largely on cold winter weather and geopolitical concerns (ags & energy) and flight to safety (precious metals).
3. Sentiment: **NEUTRAL**
   - The improvement in macroeconomic sentiment in the U.S. year-to-date has softened while EM continues to exhibit weakness and therefore not resulted in flows into commodities.
   - Exogenous shocks have pushed up specific commodities in energy and ags although demand has largely not driven prices.
   - Looking across the individual commodities, most remain well supplied, which has been reflected in prices as inflationary fears have abated.

Commentary:

IMD maintained a tactical underweight position relative to the SAAP during 2013 and into 2014 after recognizing the potential effects of Fed tapering and Chinese transition. IMD recognizes that Fed tapering will be data dependent but the Fed has been clear about its intention to reduce stimulus. China's transition to a more consumer oriented economy will be gradual but the era of infrastructure build-out which fueled a portion of the demand for commodities is abating.

IMD will closely monitor the growth and inflation dynamics globally with improving economic conditions and inflationary pressures serving as a catalyst which may initiate a neutral position.

CURRENT PORTFOLIO POSTURE: UNDERWEIGHT vs. SAA target

OPPORTUNISTIC INVESTMENTS

IMD continues to monitor and assess co-investment flow from real estate, private equity and debt managers for select opportunistic equity investments in idiosyncratic opportunities with favorable capital market dynamics. Opportunistic investments are tactical in nature AND are outside ASRS SAAP benchmarks or are absolute return oriented.

CURRENT PORTFOLIO POSTURE: APPROX 3.5% of ASRS TOTAL MARKET VALUE

GLOSSARY

Commentary: Provides verbiage on 1) the current asset class market environment and possible changes to this environment and 2) ASRS asset class portfolio positioning relative to ASRS SAA policy, its rationale for positioning and anticipated changes which may occur in such positioning.

Current Portfolio Posture: Indicates ASRS asset class position relative to its asset allocation policy weight. “Overweight” indicates an asset class weight is greater than its policy target, “Neutral” indicates an equal weight and “Underweight” indicates a lesser weight than its policy target.

Investment House Views: Synthesizes IMD’s current and forward-looking investment perspectives and tactical positioning in asset classes and investment strategies in which the ASRS invests.

Primary Market Metrics and Indicators: Broadly-defined metrics (Fundamentals, Valuations, and Sentiments) applied universally to ASRS asset classes and used collectively to evaluate existing market conditions. Indicators (“Positive,” “Neutral” and “Negative”) reflect IMD’s existing views of these metrics and, in addition to other factors, generally determine the basis for the existing (and possible future changes) to ASRS aggregate portfolio position relative to or within ASRS SAA policy targets.

ASRS INVESTMENT MEETINGS										
2014		Asset Class Committees					Board Committee			Grand Totals
		Private Market Committee (PRIFMC)			Public Market Committee (PUBMC)		Investment Committee (IC)			
Quarter	Month	Dates		Total	Dates	Total	Dates		Total	
1st	January	1/15	1/31	2	1/31	1	1/31		1	9
	February	2/21		1			2/20	2/24	2	
	March	3/24		1	3/27	1				
2nd	April									
	May									
	June									
3rd	July									
	August									
	September									
4th	October									
	November									
	December									
Totals				4		2			3	9

PRIVATE MARKETS COMMITTEE (PRIVMC)

2/21/2014

- **Private Equity Program**

  - The Committee approved a $75 million commitment to a private equity (tech-focus) buyout manager, pending final legal negotiations. The ASRS is currently invested in a previous fund managed by this GP.
  - The Committee approved a $50 million commitment to a private equity buyout manager, pending final legal negotiations. The ASRS is currently invested in a previous fund managed by this GP.

- **Niche and Tactical Real Estate Investments**

  - The Committee approved a $350 million to niche and tactical real estate investments which authorize the development of a detail plan for implementation. Each investment will be presented to the Committee for discussion and potential approval.

- **Residential Land**

  - The Committee approved a $100 million commitment to residential land. Each investment will be presented to the Committee for discussion and potential approval.

3/24/14

- **Private Equity Program**

  - The Committee approved a $75 million commitment to a private equity buyout manager, pending final legal negotiations.
  - The Committee approved $50 million investment in private placement (bridge equity financing) in a company of an existing ASRS GP, pending legal negotiations. Due diligence and valuation analyses was conducted by KPMG; this investment will be part of the opportunistic equity portfolio.

PUBLIC MARKETS COMMITTEE (PUBMC)

03/27/14:

- **Public Equities Program**

  - The Committee approved a modification to the ASRS roster of Non-U.S. Developed equity managers (specific terminations/hiring and dollars) pending contract negotiations and the use of a transition manager service to assist IMD staff with the reallocation of securities and cash.

TACTICAL PORTFOLIO POSITIONING

In March, IMD migrated approximately $400 million from U.S. equities -- $260 million from passive strategies and $140 million from active managers – to a passive Blackrock core fixed income fund. This action reduced our policy overweight in equities and policy underweight in fixed income by approximately 1.25%. The rationale for this tactical repositioning was primarily based on asset class relative value and perceived managers' strength.

Additionally, IMD began defunding approximately $300 million opportunistic debt strategy with Guggenheim that invests in structured credit. While the Guggenheim mandate has performed well (16.8% ITD IRRs), the specific markets in which they invest no longer offer attractive return potential versus other opportunistic and private debt mandates. Liquidation of the Guggenheim account will occur on an orderly basis and be executed in the context of the market. Proceeds will be used to fund other opportunistic debt and private debt investment capital calls.

We will discuss this tactical portfolio repositioning in more detail at the IC meeting.

Note: tactical portfolio positioning is captured in the ASRS Asset Allocation report; the performance results of tactical positioning (vs. policy targets) are reflected in the ASRS Quarterly Total Fund Performance Attribution Analysis.

IMD (INVESTMENT MANAGEMENT DIVISION) ACTIVITIES, PROJECTS AND RESEARCH INITIATIVES

- As an update to the Director's biweekly staff Investment Idea Exchange meetings, IMD is researching and developing an enhanced methodology regarding ASRS cash flow management, portfolio rebalancing and tactical asset allocation processes. IMD has organized itself into a series of working groups to pursue a multi-step process which covers the following: literature review, identification of methods and goals, performance attribution, risk exposure and analysis, signals, modeling and synthetic implementation, actual implementation and ex-ante analysis and reporting.

  Substantial progress is being made in developing this framework. IMD is evaluating research literature such as TAA signals and optimization processes in addition to exploring various implementation platforms. A Black-Litterman model is being evaluated which incorporates IMD Investment House Views and ASRS SAAP with scenario analyses capabilities. Likewise, various attribution methodologies are being evaluated with the objective to better enhance measuring the effects of internal and external TAA.

  Completion of this work is expected in Q2-14 and will be discussed in more detail with the IC at that time.

- The redesign of ASRS securities lending program is pending final contract negotiations with State Street. The program will include two parts: 'base lending' to initiate a conservative strategic lending program and 'opportunistic lending' to profit from relatively large or one-off individual lending transactions, the latter of which will be evaluated and potentially approved on a case-by-case basis by the Director and CIO.

- The IMD is researching cash management options to mitigate cash drag on total fund returns and facilitate monthly pension funding requirements by ensuring that excess cash balances are synthetically exposed to either equity or fixed income markets. All options under consideration are designed to provide ample liquidity to meet pension funding needs while minimizing implementation and transaction costs.

  A final decision by the Director and CIO are expected in Q2-14; implementation will occur soon thereafter.

- In February, ASRS Private Markets PM facilitated a forum on the US home construction industry, discussing the structure of housing demand, the builder supply chain, homebuilders' perspective on risk management, the relationship between builders and land providers, and the mitigation of entitlement risk. These discussions provided context to and support for a potential further investment opportunity in residential real estate and included a panel of four experts in real estate.

- As a standard course of business, IMD meets with both incumbent and potential investment managers to discuss macro-economies and capital markets as well as providing a means to review new initiatives, relationships and new strategy offerings. Since the last IC meeting, IMD has met via conference call or in-person with a total of 71 investment managers: Private markets (RE, PE, Debt) – 46 and Public markets (Equity and Debt) – 25.

- IMD internally manages 7 public equities and fixed income portfolios which had an aggregate market value of over $9.5 billion or 30% of Total Fund. For CY2014 thru Feb 28, 3 of 7 met or exceeded their benchmarks, and 7 of 7 portfolios met or exceeded their benchmarks on an inception-to-date basis.

STATE STREET GLOBAL SERVICES®

STATE STREET INVESTMENT ANALYTICS

Executive Presentation

To: Arizona State Retirement System

truView Risk Report February 28, 2014

Produced by State Street Investment Analytics, Risk Services

Monthly Reallocation Summary*

Month Ending March 31, 2014

Portfolio Reductions

- TOTAL US EQUITY
  - $255M – DOMESTIC TRANSITION
- TOTAL OPPORTUNISTIC
  - $209M – GUGGENHEIM PARTNERS
- **TOTAL REDUCTIONS****
  - **$464M**

Portfolio Additions

- TOTAL MASTER CASH
  - $464M – MASTER CASH
- **TOTAL ADDITIONS****
  - **$464M**

***Based on State Street accounting records for public markets and therefore exclude private market drawdowns.**
****Reductions and additions do not include plan distributions.**

Monthly Reallocation Summary*

Month Ending February 28, 2014

Portfolio Reductions

- TOTAL US EQUITY
  - $10.75M – E7 US Large Cap)
  - $5.75M – E8 (US Large Cap)
  - $1.5M – E3 (US Mid Cap)
  - $5.4M – E4 (US Mid Cap)
  - $98.5M – DOMESTIC TRANSITION
- TOTAL MASTER CASH
  - $140M – MASTER CASH
- **TOTAL REDUCTIONS****
  - **$261.9M**

Portfolio Additions

- TOTAL MASTER CASH
  - $121.9M – MASTER CASH
- TOTAL FIXED INCOME
  - $140M – F2 (Core)
- **TOTAL ADDITIONS****
  - **$261.9M**

***Based on State Street accounting records for public markets and therefore exclude private market drawdowns.**
****Reductions and additions do not include plan distributions.**

Monthly Risk Summary

Month Ending February 28, 2014

Month-end Risk Profile

- Historical Risk (95% VaR) for all asset classes remain relatively constant from prior months with no substantial deltas. Total Plan risk decreased 15bps with corresponding 12bps decrease in the Policy Benchmark. A relatively steady market environment has helped produced a stable risk profile since the beginning of last year.

- Excess risk over the Policy Benchmark decreased by 3bps from the prior month to settle at -0.8%.

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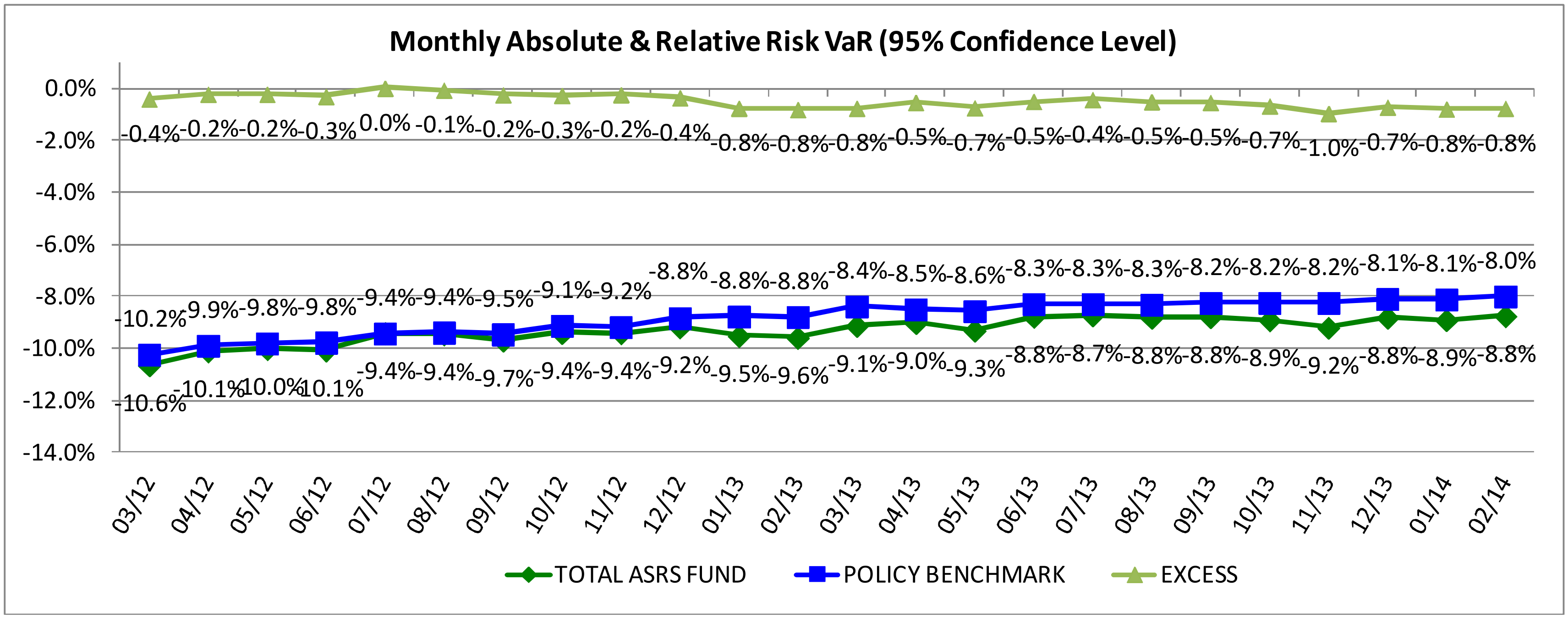


ARIZONA STATE RETIREMENT SYSTEM

TOTAL PLAN EXPOSURE OVERVIEW

As of February 28, 2014

Sector (Public US Equity Only)		$ Value	% Value	**Blended US BM	Difference
BASIC MATERIALS	$	357,799,429	3.2%	3.3%	(0.1%)
CASH	$	149,081,715	1.3%	0.0%	1.3%
COMMUNICATIONS	$	974,202,836	8.7%	12.3%	(3.5%)
CONSUMER CYCLICAL	$	1,133,525,089	10.2%	9.6%	0.5%
CONSUMER NON-CYCLICAL	$	2,506,038,008	22.5%	22.0%	0.5%
DIVERSIFIED	$	2,485,982	0.0%	0.1%	(0.0%)
ENERGY	$	925,026,196	8.3%	10.0%	(1.7%)
FINANCIAL	$	1,712,505,182	15.4%	16.4%	(1.1%)
FUNDS	$	484,080,000	4.3%	0.0%	4.3%
GOVERNMENT	$	28,118,853	0.3%	0.0%	0.3%
INDEX	$	21,699,508	0.2%	0.0%	0.2%
INDUSTRIAL	$	1,283,674,259	11.5%	10.8%	0.7%
TECHNOLOGY	$	1,212,550,786	10.9%	12.4%	(1.6%)
UTILITIES	$	353,911,441	3.2%	3.0%	0.2%
GRAND TOTAL	**$**	**11,144,699,283**	**100.0%**	**100.0%**	**0.0%**

Country Category (Total Plan)		$ Value	% Value	*Blended TOTAL BM	Difference
AFRICA	$	297,199,969	0.9%	0.8%	0.1%
ASIA DEVELOPED	$	1,843,095,763	5.6%	8.9%	(3.3%)
ASIA EM	$	1,129,384,470	3.5%	4.5%	(1.0%)
EUROPE DEVELOPED	$	3,990,853,212	12.2%	14.5%	(2.3%)
EUROPE EM	$	148,998,114	0.5%	1.0%	(0.5%)
LATIN AMERICA	$	993,484,657	3.0%	3.2%	(0.2%)
MIDDLE EAST	$	124,649,587	0.4%	0.4%	0.0%
NORTH AMERICA	$	24,184,808,675	73.9%	66.7%	7.2%
GRAND TOTAL	**$**	**32,712,474,446**	**100.0%**	**100.0%**	**0.0%**

Market Cap^ (Public Equities Only)		$ Value	% Value	*Blended TOTAL BM	Difference
1) 0 - 100M	$	3,171,850	0.0%	0.0%	0.0%
2) 100M - 500M	$	638,237,683	3.2%	1.3%	1.9%
3) 500M - 1B	$	397,342,758	2.0%	3.4%	(1.4%)
4) 1B - 5B	$	3,445,729,337	17.4%	22.5%	(5.1%)
5) 5B - 10B	$	2,284,503,538	11.5%	11.2%	0.4%
6) 10B - 50B	$	5,486,175,024	27.7%	27.6%	0.1%
7) >50B	$	7,529,537,903	38.1%	34.0%	4.0%
GRAND TOTAL	**$**	**19,784,698,093**	**100.0%**	**100.0%**	**100.0%**

^Excludes cash and non-traded securities

	Top 20 Issuer (Total Plan)		$ Value	% Value	Market Cap	Sector	Industry Group
1	Cash***	$	1,525,673,990	4.7%		CASH	Cash
2	SPDR S&P 500 ETF TRUST	$	1,257,308,468	3.8%	7) 50B+	FUNDS	EQUITY FUND
3	US TREASURY N/B	$	856,266,511	2.6%		GOVERNMENT	SOVEREIGN
4	FANNIE MAE	$	795,140,333	2.4%		MORTGAGE SECURITIES	FNMA COLLATERAL
5	TREASURY BILL	$	737,423,105	2.3%		GOVERNMENT	SOVEREIGN
6	APPLE INC	$	195,362,350	0.6%	7) 50B+	TECHNOLOGY	COMPUTERS
7	EXXON MOBIL CORP	$	188,500,126	0.6%	7) 50B+	ENERGY	OIL&GAS
8	FREDDIE MAC	$	179,525,904	0.6%		MORTGAGE SECURITIES	FGLMC COLLATERAL
9	MICROSOFT CORP	$	143,007,186	0.4%	7) 50B+	TECHNOLOGY	SOFTWARE
10	JOHNSON & JOHNSON	$	126,348,141	0.4%	7) 50B+	CONSUMER NON-CYCLICAL	PHARMACEUTICALS
11	ISHARES MSCI USA MOMENTUM FACT(	$	125,160,000	0.4%	2) 100M - 500I	FUNDS	EQUITY FUND
12	VANGUARD TOTAL STOCK MARKET ET	$	123,430,929	0.4%	6) 10B - 50B	FUNDS	EQUITY FUND
13	ISHARES MSCI USA QUALITY FACTOR I	$	122,120,000	0.4%	2) 100M - 500I	FUNDS	EQUITY FUND
14	PFIZER INC	$	120,995,686	0.4%	7) 50B+	CONSUMER NON-CYCLICAL	PHARMACEUTICALS
15	ISHARES MSCI USA VALUE FACTOR ET	$	119,400,000	0.4%	2) 100M - 500I	FUNDS	EQUITY FUND
16	ISHARES MSCI USA SIZE FACTOR ETF	$	117,400,000	0.4%	2) 100M - 500I	FUNDS	EQUITY FUND
17	CHEVRON CORP	$	116,949,810	0.4%	7) 50B+	ENERGY	OIL&GAS
18	VANGUARD FTSE DEVELOPED MARKE	$	112,910,234	0.4%	6) 10B - 50B	FUNDS	EQUITY FUND
19	GOOGLE INC	$	108,294,965	0.3%	7) 50B+	COMMUNICATIONS	INTERNET
20	MERCK & CO INC	$	101,254,197	0.3%	7) 50B+	CONSUMER NON-CYCLICAL	PHARMACEUTICALS

*Blended TOTAL BM: 26% SP500, 5% SP400, 5% SP600, 5% R2000, 14% MSCI EAFE, 6% MSCI EM, 3% MSCI Sml Cap, 17% BC US AGG, 5% BC US HY, 6% FTSE NAREIT GLOBAL, 4% DJ-UBS COMMODITY, 4% JPM EMBI.

**Blended US BM: 72% SP500, 14% SP400, 14% SP600.

***Cash does not represent an IMD tactical view; **Cash** includes the ASRS Master Cash balance, manager- level portfolio cash & equivalents and cash collateralizing sundry portfolio-level futures contracts.

ARIZONA STATE RETIREMENT SYSTEM **INTERNATIONAL EQUITY EXPOSURE OVERVIEW**

As of February 28, 2014

Sector (Public Intl Equity Only)		$ Value	% Value	*Blended NON-US BM	Difference
BASIC MATERIALS	$	462,642,720	6.6%	7.9%	(1.3%)
CASH	$	78,637,235	1.1%	0.0%	1.1%
COMMUNICATIONS	$	655,229,471	9.3%	8.7%	0.6%
CONSUMER CYCLICAL	$	837,466,772	11.9%	12.0%	(0.2%)
CONSUMER NON-CYCLICAL	$	1,351,874,630	19.2%	18.3%	0.8%
DIVERSIFIED	$	68,835,761	1.0%	1.1%	(0.1%)
ENERGY	$	496,509,796	7.0%	7.2%	(0.2%)
FINANCIAL	$	1,647,052,389	23.4%	24.6%	(1.3%)
FUNDS	$	82,468	0.0%	0.0%	0.0%
FX	$	(16,206)	(0.0%)	0.0%	(0.0%)
INDEX	$	35,744,741	0.5%	0.0%	0.5%
INDUSTRIAL	$	868,779,016	12.3%	11.9%	0.4%
TECHNOLOGY	$	328,605,379	4.7%	5.0%	(0.3%)
UTILITIES	$	222,301,690	3.2%	3.3%	(0.1%)
GRAND TOTAL	**$**	**7,053,745,862**	**100.0%**	**100.0%**	**0.0%**

Country Category (Public Intl Equity Only)		$ Value	% Value	*Blended NON-US BM	Difference
AFRICA	$	173,476,435	2.5%	2.0%	0.4%
ASIA DEVELOPED	$	1,801,015,005	25.5%	29.8%	(4.3%)
ASIA EMERGING	$	905,291,953	12.8%	13.3%	(0.4%)
EUROPE DEVELOPED	$	3,447,171,011	48.9%	48.9%	0.0%
EUROPE EMERGING	$	74,062,125	1.0%	0.7%	0.4%
LATIN AMERICA	$	414,397,324	5.9%	4.9%	1.0%
MIDDLE EAST	$	85,554,658	1.2%	0.4%	0.8%
NORTH AMERICA	$	152,777,350	2.2%	0.1%	2.1%
GRAND TOTAL	**$**	**7,053,745,862**	**100.0%**	**100.0%**	**0.0%**

Top 20 Industry Groups (Public Intl Only			$ Value	% Value	*Blended NON-US BM	Difference
1	BANKS	$	843,100,523	12.0%	13.5%	(1.5%)
2	PHARMACEUTICALS	$	436,698,480	6.2%	6.3%	(0.1%)
3	OIL&GAS	$	436,698,071	6.2%	6.4%	(0.2%)
4	TELECOMMUNICATIONS	$	432,187,343	6.1%	5.7%	0.4%
5	INSURANCE	$	399,306,703	5.7%	4.6%	1.0%
6	FOOD	$	361,817,563	5.1%	4.6%	0.6%
7	RETAIL	$	244,828,319	3.5%	3.1%	0.3%
8	AUTO MANUFACTURERS	$	207,857,325	2.9%	3.3%	(0.3%)
9	CHEMICALS	$	200,822,627	2.8%	3.4%	(0.5%)
10	SEMICONDUCTORS	$	171,258,502	2.4%	2.7%	(0.3%)
11	COMMERCIAL SERVICES	$	160,797,502	2.3%	1.7%	0.5%
12	MINING	$	160,110,436	2.3%	2.8%	(0.5%)
13	DIVERSIFIED FINAN SERV	$	150,774,528	2.1%	2.5%	(0.4%)
14	ELECTRIC	$	142,437,129	2.0%	2.2%	(0.2%)
15	REAL ESTATE	$	141,522,910	2.0%	2.0%	0.0%
16	BEVERAGES	$	134,864,458	1.9%	2.1%	(0.1%)
17	ENGINEERING&CONSTRUCTI(	$	127,562,806	1.8%	1.8%	0.1%
18	TRANSPORTATION	$	119,978,785	1.7%	1.5%	0.2%
19	INTERNET	$	119,599,756	1.7%	1.3%	0.4%
20	BUILDING MATERIALS	$	103,045,023	1.5%	1.4%	0.1%

Market Cap** (Public Intl Equities Only)		$ Value	% Value	*Blended NON-US BM	Difference
1) 0 - 100M	$	2,968,935	0.0%	0.0%	0.0%
2) 100M - 500M	$	121,257,074	1.8%	0.8%	0.9%
3) 500M - 1B	$	233,321,854	3.4%	1.9%	1.5%
4) 1B - 5B	$	1,322,002,201	19.1%	15.4%	3.7%
5) 5B - 10B	$	847,209,288	12.2%	12.5%	(0.2%)
6) 10B - 50B	$	2,252,684,855	32.5%	34.2%	(1.7%)
7) >50B	$	2,142,249,881	30.9%	35.2%	(4.3%)
GRAND TOTAL	**$**	**6,921,694,088**	**100.0%**	**100.0%**	**100.0%**

**Excludes cash and non-traded securities

***Blended NON-US BM**: 61% MSCI EAFE, 26% MSCI EM, 13% MSCI Sml Cap.

ARIZONA STATE RETIREMENT SYSTEM

TOTAL FIXED INCOME EXPOSURE OVERVIEW

As of February 28, 2014

Sector (Public Fixed Income Only)	$ Value	% Value	*Blended FI BM	Difference
ASSET BACKED SECURITIES	$ 15,390,547	0.3%	0.3%	0.1%
BASIC MATERIALS	$ 67,720,305	1.5%	2.3%	(0.8%)
CASH	$ 138,715,462	3.2%	0.0%	3.2%
COMMUNICATIONS	$ 338,186,800	7.7%	5.3%	2.4%
CONSUMER CYCLICAL	$ 229,739,245	5.2%	3.7%	1.5%
CONSUMER NON-CYCLICAL	$ 308,143,584	7.0%	5.4%	1.6%
DIVERSIFIED	$ 5,892,144	0.1%	0.2%	(0.1%)
ENERGY	$ 264,531,104	6.0%	6.3%	(0.3%)
FINANCIAL	$ 372,619,004	8.5%	8.6%	(0.1%)
FIXED INCOME	$ 9,300	0.0%	0.0%	0.0%
FUNDS	$ 2,573,647	0.1%	0.0%	0.1%
FUTURES	$ (14,747)	(0.0%)	0.0%	(0.0%)
FX	$ (3,326,993)	(0.1%)	0.0%	(0.1%)
GOVERNMENT	$ 1,568,800,942	35.7%	40.7%	(5.1%)
INDEX	$ 6,842,457	0.2%	0.0%	0.2%
INDUSTRIAL	$ 160,795,553	3.7%	3.1%	0.5%
LOAN	$ 12,965,449	0.3%	0.0%	0.3%
MORTGAGE SECURITIES	$ 739,929,189	16.8%	20.3%	(3.5%)
SWAP	$ (978,699)	(0.0%)	0.0%	(0.0%)
SWAPTION	$ (3)	(0.0%)	0.0%	(0.0%)
TECHNOLOGY	$ 87,571,508	2.0%	1.4%	0.6%
TERM DEPOSIT	$ 8,099,906	0.2%	0.0%	0.2%
UTILITIES	$ 75,363,353	1.7%	2.3%	(0.6%)
GRAND TOTAL	**$ 4,399,569,058**	**100.0%**	**100.0%**	**0.0%**

Top 20 Industry Groups (Public Fixed Income Only)	$ Value	% Value	*Blended FI BM	Difference
1 SOVEREIGN	$ 1,503,383,943	34.2%	38.8%	(4.6%)
2 FNMA COLLATERAL	$ 539,305,263	12.3%	8.8%	3.4%
3 TELECOMMUNICATIONS	$ 198,747,860	4.5%	3.1%	1.4%
4 OIL&GAS	$ 186,940,920	4.2%	4.6%	(0.4%)
5 BANKS	$ 161,380,017	3.7%	5.1%	(1.4%)
6 Cash	$ 138,715,462	3.2%	0.0%	3.2%
7 MEDIA	$ 113,985,792	2.6%	1.8%	0.7%
8 DIVERSIFIED FINAN SERV	$ 108,940,340	2.5%	2.1%	0.4%
9 COMMERCIAL MBS	$ 97,030,775	2.2%	1.1%	1.1%
10 HEALTHCARE-SERVICES	$ 75,492,034	1.7%	1.1%	0.6%
11 RETAIL	$ 74,131,325	1.7%	1.3%	0.4%
12 FGLMC COLLATERAL	$ 73,287,720	1.7%	5.2%	(3.5%)
13 ELECTRIC	$ 73,164,544	1.7%	2.2%	(0.5%)
14 COMMERCIAL SERVICES	$ 66,563,707	1.5%	0.9%	0.6%
15 SOFTWARE	$ 54,892,400	1.2%	0.7%	0.6%
16 PIPELINES	$ 50,091,475	1.1%	1.1%	0.0%
17 MUNICIPAL	$ 48,279,917	1.1%	0.6%	0.5%
18 PHARMACEUTICALS	$ 43,458,400	1.0%	1.0%	0.0%
19 LODGING	$ 42,572,338	1.0%	0.5%	0.5%
20 INSURANCE	$ 41,051,806	0.9%	0.8%	0.2%

Credit Rating Group** (Public Fixed Income Only)	$ Value	% Value	*Blended FI BM	Difference
01) AAA	$ 1,759,567,626	40.0%	47.5%	(7.5%)
02) AA	$ 146,744,377	3.3%	3.7%	(0.3%)
03) A	$ 633,626,312	14.4%	8.9%	5.5%
04) BBB	$ 441,250,906	10.0%	15.3%	(5.3%)
05) BB	$ 551,062,311	12.5%	11.9%	0.6%
06) B	$ 531,801,815	12.1%	8.8%	3.3%
07) CCC	$ 186,555,816	4.2%	3.1%	1.1%
08) CC	$ -	0.0%	0.1%	(0.1%)
09) C	$ 465,362	0.0%	0.0%	(0.0%)
10) D	$ -	0.0%	0.1%	(0.1%)
11) Not Rated	$ 148,494,533	3.4%	0.6%	2.8%
GRAND TOTAL	**$ 4,399,569,058**	**100.0%**	**100.0%**	**0.0%**

Maturity Bucket (Public Fixed Income Only)	$ Value	% Value	*Blended FI BM	Difference
0-1Y	$ 353,570,768	8.1%	0.5%	7.5%
1Y-3Y	$ 475,163,916	10.8%	17.9%	(7.1%)
3Y-5Y	$ 668,898,094	15.2%	16.7%	(1.5%)
5Y-10Y	$ 1,829,282,749	41.7%	30.7%	10.9%
10Y-15Y	$ 136,667,974	3.1%	6.2%	(3.1%)
15Y+	$ 928,123,617	21.1%	27.9%	(6.8%)
GRAND TOTAL	**$ 4,391,707,118**	**100.0%**	**100.0%**	**100.0%**

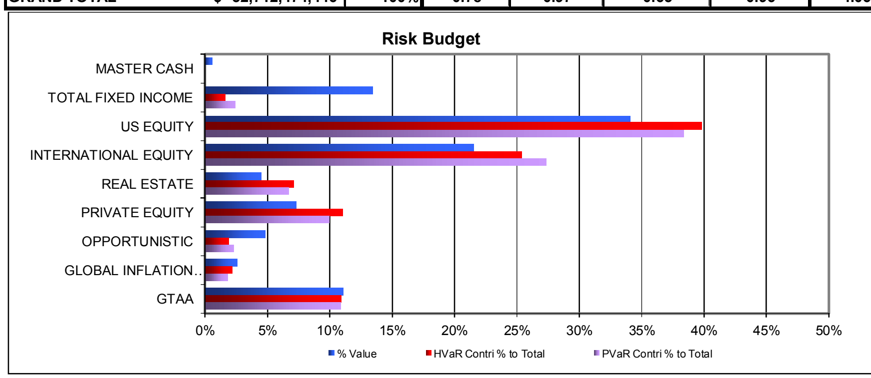
***Blended TOTAL BM**: 66% BC US AGG, 19% BC US HY, 15% JPM EMBI.

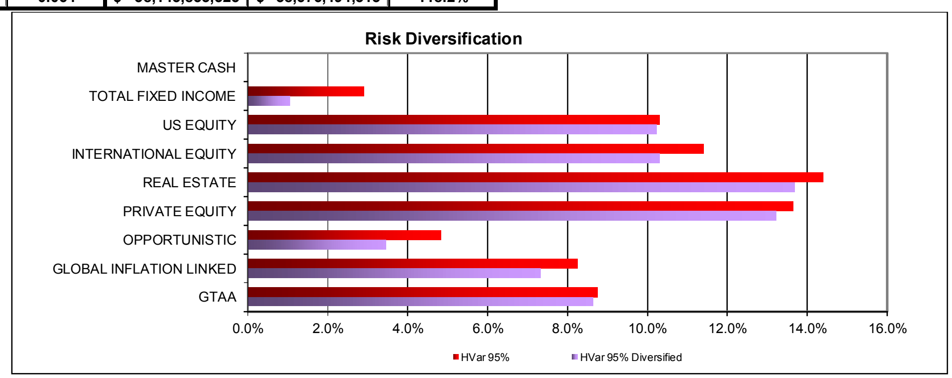
ARIZONA STATE RETIREMENT SYSTEM **TOTAL PLAN RISK OVERVIEW**

As of February 28, 2014

Strategy	$ Value	% Value	Historical VaR 95%	HVaR Contri 95%	HVaR Contri % to Total	Parametric VaR 95%	PVaR Contri 95%	PVaR Contri % to Total	Exp Tail Loss 95%	Exp Tail Loss Contri 95%	Exp Tail Loss Contri % to Total	Max Loss	Std Dev	Downside Risk (8%)	Downside Risk Contri (8%)	Downside Risk Contri (8%) to Total
MONTHLY RISK																
MASTER CASH	$ 189,010,112	1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	(0.6%)	(0.0%)	0.0%
TOTAL FIXED INCOME	$ 4,399,569,058	13%	(2.9%)	(0.1%)	1.6%	(2.6%)	(0.2%)	2.4%	(4.4%)	(0.3%)	2.0%	(6.6%)	1.5%	(1.6%)	(0.1%)	2.6%
US EQUITY	$ 11,144,699,283	34%	(10.3%)	(3.5%)	39.8%	(9.3%)	(3.1%)	38.4%	(16.5%)	(5.5%)	39.5%	(30.6%)	6.5%	(4.7%)	(1.6%)	38.4%
INTERNATIONAL EQUITY	$ 7,053,745,862	22%	(11.4%)	(2.2%)	25.4%	(10.6%)	(2.2%)	27.4%	(17.1%)	(3.6%)	25.8%	(37.0%)	7.2%	(5.2%)	(1.1%)	26.6%
REAL ESTATE	$ 1,479,877,618	5%	(14.4%)	(0.6%)	7.1%	(12.8%)	(0.5%)	6.7%	(22.1%)	(0.9%)	6.6%	(40.2%)	8.3%	(6.3%)	(0.3%)	6.6%
PRIVATE EQUITY	$ 2,395,017,265	7%	(13.7%)	(1.0%)	11.1%	(11.6%)	(0.8%)	10.0%	(20.2%)	(1.5%)	10.5%	(36.4%)	7.6%	(5.8%)	(0.4%)	10.1%
OPPORTUNISTIC	$ 1,582,211,854	5%	(4.8%)	(0.2%)	1.9%	(4.5%)	(0.2%)	2.3%	(8.8%)	(0.4%)	2.8%	(17.3%)	3.1%	(2.5%)	(0.1%)	2.5%
GLOBAL INFLATION LINKEI	$ 842,418,503	3%	(8.3%)	(0.2%)	2.2%	(8.1%)	(0.1%)	1.8%	(13.1%)	(0.3%)	1.9%	(26.5%)	5.2%	(4.1%)	(0.1%)	2.0%
GTAA	$ 3,625,924,892	11%	(8.8%)	(1.0%)	10.9%	(8.1%)	(0.9%)	10.9%	(14.1%)	(1.5%)	10.9%	(29.9%)	5.2%	(4.2%)	(0.5%)	11.3%
GRAND TOTAL	**$ 32,712,474,446**	**100%**	**(8.8%)**	**(8.8%)**	**100.0%**	**(8.1%)**	**(8.1%)**	**100.0%**	**(14.0%)**	**(14.0%)**	**100.0%**	**(28.6%)**	**5.5%**	**(4.1%)**	**(4.1%)**	**100.0%**
INTERIM POLICY BENCHMARK			***(8.0%)***			***(7.5%)***			***(12.7%)***			***(25.9%)***	***6.7%***	***(3.8%)***		
ANNUALIZED RISK																
MASTER CASH	$ 189,010,112	1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A	0.0%	(2.2%)	(0.0%)	0.0%
TOTAL FIXED INCOME	$ 4,399,569,058	13%	(10.1%)	(0.5%)	1.6%	(8.9%)	(0.7%)	2.4%	(15.3%)	(1.0%)	2.0%	N/A	5.3%	(5.5%)	(0.4%)	2.6%
US EQUITY	$ 11,144,699,283	34%	(35.7%)	(12.1%)	39.8%	(32.2%)	(10.8%)	38.4%	(57.3%)	(19.1%)	39.5%	N/A	22.4%	(16.3%)	(5.5%)	38.4%
INTERNATIONAL EQUITY	$ 7,053,745,862	22%	(39.5%)	(7.7%)	25.4%	(36.9%)	(7.7%)	27.4%	(59.3%)	(12.5%)	25.8%	N/A	24.9%	(17.9%)	(3.8%)	26.6%
REAL ESTATE	$ 1,479,877,618	5%	(49.9%)	(2.1%)	7.1%	(44.3%)	(1.9%)	6.7%	(76.5%)	(3.2%)	6.6%	N/A	28.6%	(21.7%)	(0.9%)	6.6%
PRIVATE EQUITY	$ 2,395,017,265	7%	(47.3%)	(3.4%)	11.1%	(40.1%)	(2.8%)	10.0%	(70.0%)	(5.1%)	10.5%	N/A	26.4%	(20.1%)	(1.4%)	10.1%
OPPORTUNISTIC	$ 1,582,211,854	5%	(16.8%)	(0.6%)	1.9%	(15.5%)	(0.7%)	2.3%	(30.6%)	(1.3%)	2.8%	N/A	10.8%	(8.8%)	(0.4%)	2.5%
GLOBAL INFLATION LINKEI	$ 842,418,503	3%	(28.6%)	(0.7%)	2.2%	(28.1%)	(0.5%)	1.8%	(45.4%)	(0.9%)	1.9%	N/A	17.9%	(14.2%)	(0.3%)	2.0%
GTAA	$ 3,625,924,892	11%	(30.3%)	(3.3%)	10.9%	(28.0%)	(3.1%)	10.9%	(48.7%)	(5.3%)	10.9%	N/A	18.2%	(14.6%)	(1.6%)	11.3%
GRAND TOTAL	**$ 32,712,474,446**	**100%**	**(30.3%)**	**(30.3%)**	**100.0%**	**(28.0%)**	**(28.0%)**	**100.0%**	**(48.5%)**	**(48.5%)**	**100.0%**	**N/A**	**18.9%**	**(14.3%)**	**(14.3%)**	**100.0%**
INTERIM POLICY BENCHMARK			***(27.7%)***			***(26.0%)***			***(44.1%)***			***N/A***	***23.3%***	***(13.1%)***		

Strategy	$ Value	% Value	Beta SP500	Corr SP500	Beta MSCI EAFE	Corr MSCI EAFE	Duration	Convexity	Notional Exposure	Gross Exposure	Gross Leverage
MASTER CASH	$ 189,010,112	1%	0.00		0.00				$ 189,010,112	$ 189,010,112	100.0%
TOTAL FIXED INCOME	$ 4,399,569,058	13%	0.11	0.45	0.11	0.56	4.81	0.106	$ 4,699,670,810	$ 5,843,095,609	132.8%
US EQUITY	$ 11,144,699,283	34%	1.08	0.99	0.84	0.91	0.71	0.005	$ 11,270,597,289	$ 11,153,756,082	100.1%
INTERNATIONAL EQUITY	$ 7,053,745,862	22%	1.11	0.91	1.02	0.98	0.09	0.001	$ 7,053,820,959	$ 7,127,791,786	101.0%
REAL ESTATE	$ 1,479,877,618	5%	1.25	0.89	1.07	0.90			$ 1,479,877,618	$ 1,481,090,300	100.1%
PRIVATE EQUITY	$ 2,395,017,265	7%	1.25	0.96	0.95	0.87			$ 2,395,017,265	$ 2,395,017,265	100.0%
OPPORTUNISTIC	$ 1,582,211,854	5%	0.45	0.85	0.37	0.82	0.08	(0.028)	$ 1,631,393,715	$ 1,583,139,874	100.1%
GLOBAL INFLATION LINKEI	$ 842,418,503	3%	0.30	0.68	0.26	0.70	0.26	0.001	$ 1,684,902,503	$ 842,418,503	100.0%
GTAA	$ 3,625,924,892	11%	0.40	0.96	0.34	0.96	5.39	(0.131)	$ 7,739,563,054	$ 8,061,174,782	222.3%
GRAND TOTAL	**$ 32,712,474,446**	**100%**	**0.78**	**0.97**	**0.65**	**0.96**	**4.06**	**0.064**	**$ 38,143,853,325**	**$ 38,676,494,313**	**118.2%**



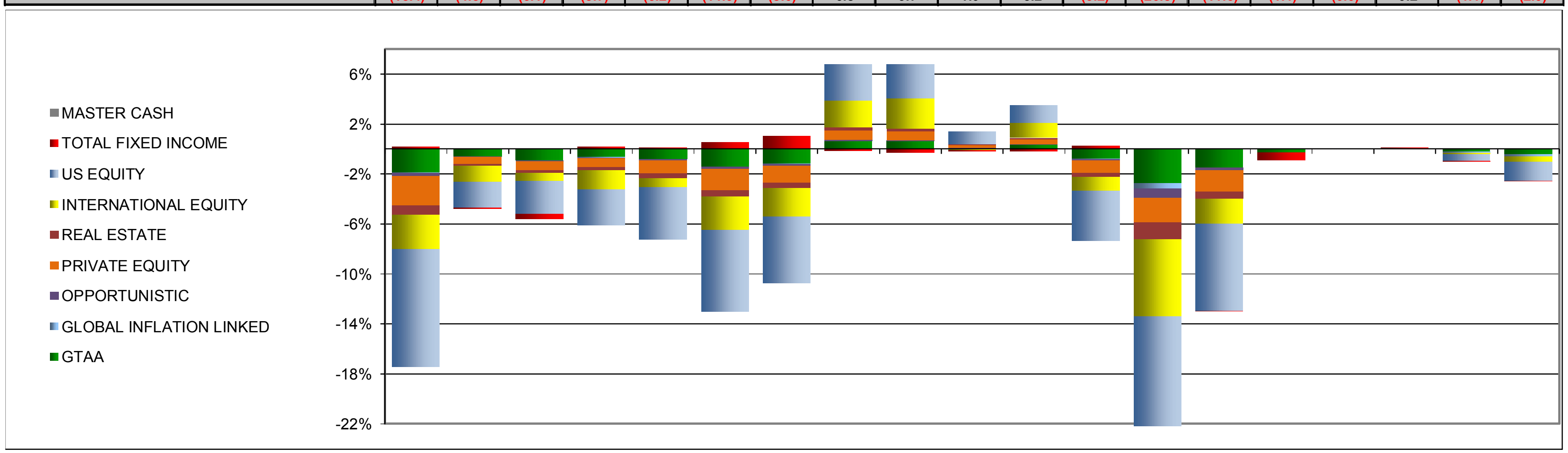


ARIZONA STATE RETIREMENT SYSTEM
As of February 28, 2014

TOTAL PLAN STRESS TESTS

Strategy	$ Value	% Value	Black Monday - 5 Day	Gulf War - 5 Day	Bond Crash: Feb 94 - May 94	Asian Crisis 97-98 - 5 day	Russian Crisis - 5 Day	Nasdaq Correction: July 98 - Aug 98	Russian Debt Crisis Aug-Oct	IR Steepening: Sept 98 - Nov 98	Emerging Markets Rally: Jan 99 - May 99	Fed Tightening: April - June 99	Nasdaq Rally: Nov 99 - Jan 00	9/11 Attack - 5 Day	2008 Lehman Bankruptcy 9/10/08 - 10/10/08	S&P Down 20%	IR Parallel Shift +100bps	Spread Up 10%	Inflation +1%	Gold Shock -20%	Oil Shock -20%
			Historical Scenarios													Predictive Scenarios					
Stress Test Stand Alone																					
MASTER CASH	$ 189,010,112	0.6%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL FIXED INCOME	$ 4,399,569,058	13.4%	1.4	(0.7)	(2.8)	1.2	0.9	3.8	7.7	(1.0)	(2.1)	(0.8)	(1.3)	2.0	(5.6)	(0.0)	(4.8)	0.0	0.5	(0.0)	(0.0)
US EQUITY	$ 11,144,699,283	34.1%	(27.7)	(6.1)	(7.8)	(8.4)	(12.3)	(19.3)	(15.7)	8.7	8.0	2.8	4.2	(11.8)	(26.6)	(20.4)	(0.0)	(0.0)	0.0	(1.6)	(4.6)
INTERNATIONAL EQUITY	$ 7,053,745,862	21.6%	(12.6)	(5.9)	(3.1)	(7.3)	(3.4)	(12.4)	(10.4)	9.8	11.3	(0.4)	5.5	(5.1)	(28.6)	(9.4)	0.0	0.0	(0.0)	(0.4)	(1.9)
REAL ESTATE	$ 1,479,877,618	4.5%	(17.0)	(3.7)	(4.9)	(5.1)	(7.5)	(12.0)	(9.6)	5.4	4.9	1.8	2.6	(7.2)	(28.7)	(12.5)	0.0	0.0	0.0	0.0	0.0
PRIVATE EQUITY	$ 2,395,017,265	7.3%	(32.3)	(7.1)	(9.3)	(9.8)	(14.3)	(22.8)	(18.4)	10.2	9.3	3.3	4.9	(13.8)	(27.1)	(23.8)	0.0	0.0	0.0	0.0	(0.0)
OPPORTUNISTIC	$ 1,582,211,854	4.8%	(5.1)	(1.1)	(1.4)	(1.6)	(2.3)	(3.6)	(2.9)	1.6	1.5	0.5	0.8	(2.2)	(15.6)	(3.8)	(0.0)	0.0	(0.0)	0.0	0.0
GLOBAL INFLATION LINKEI	$ 842,418,503	2.6%	(0.0)	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	(0.0)	(16.6)	0.0	0.0	(0.0)	(0.0)	(5.7)	(6.3)
GTAA	$ 3,625,924,892	11.1%	(17.1)	(5.4)	(8.5)	(6.1)	(7.5)	(12.9)	(10.8)	5.9	5.9	0.5	3.3	(7.3)	(24.8)	(13.5)	(2.4)	(0.0)	0.3	(1.8)	(3.9)
GRAND TOTAL	**$ 32,712,474,446**	**100.0%**	**(17.3)**	**(4.8)**	**(5.6)**	**(6.0)**	**(7.1)**	**(12.5)**	**(9.7)**	**6.7**	**6.5**	**1.2**	**3.3**	**(7.1)**	**(23.2)**	**(13.0)**	**(0.9)**	**(0.0)**	**0.1**	**(1.0)**	**(2.6)**
INTERIM POLICY BENCHMARK			**(15.4)**	**(4.5)**	**(6.1)**	**(5.7)**	**(6.2)**	**(11.9)**	**(8.0)**	**6.8**	**6.7**	**1.0**	**3.2**	**(6.2)**	**(20.8)**	**(11.6)**	**(1.4)**	**(0.0)**	**0.2**	**(1.1)**	**(2.9)**

Strategy	$ Value	% Value	Black Monday - 5 Day	Gulf War - 5 Day	Bond Crash: Feb 94 - May 94	Asian Crisis 97-98 - 5 day	Russian Crisis - 5 Day	Nasdaq Correction: July 98 - Aug 98	Russian Debt Crisis Aug-Oct	IR Steepening: Sept 98 - Nov 98	Emerging Markets Rally: Jan 99 - May 99	Fed Tightening: April - June 99	Nasdaq Rally: Nov 99 - Jan 00	9/11 Attack - 5 Day	2008 Lehman Bankruptcy 9/10/08 - 10/10/08	S&P Down 20%	IR Parallel Shift +100bps	Spread Up 10%	Inflation +1%	Gold Shock -20%	Oil Shock -20%
Stress Test Contribution																					
MASTER CASH	$ 189,010,112	0.6%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL FIXED INCOME	$ 4,399,569,058	13.4%	0.2	(0.1)	(0.4)	0.2	0.1	0.5	1.0	(0.1)	(0.3)	(0.1)	(0.2)	0.3	(0.8)	(0.0)	(0.6)	0.0	0.1	(0.0)	(0.0)
US EQUITY	$ 11,144,699,283	34.1%	(9.4)	(2.1)	(2.7)	(2.9)	(4.2)	(6.6)	(5.4)	3.0	2.7	1.0	1.4	(4.0)	(9.1)	(6.9)	(0.0)	(0.0)	0.0	(0.6)	(1.6)
INTERNATIONAL EQUITY	$ 7,053,745,862	21.6%	(2.7)	(1.3)	(0.7)	(1.6)	(0.7)	(2.7)	(2.2)	2.1	2.4	(0.1)	1.2	(1.1)	(6.2)	(2.0)	0.0	0.0	(0.0)	(0.1)	(0.4)
REAL ESTATE	$ 1,479,877,618	4.5%	(0.8)	(0.2)	(0.2)	(0.2)	(0.3)	(0.5)	(0.4)	0.2	0.2	0.1	0.1	(0.3)	(1.3)	(0.6)	0.0	0.0	0.0	0.0	0.0
PRIVATE EQUITY	$ 2,395,017,265	7.3%	(2.4)	(0.5)	(0.7)	(0.7)	(1.0)	(1.7)	(1.3)	0.8	0.7	0.2	0.4	(1.0)	(2.0)	(1.7)	0.0	0.0	0.0	0.0	(0.0)
OPPORTUNISTIC	$ 1,582,211,854	4.8%	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(0.1)	0.1	0.1	0.0	0.0	(0.1)	(0.8)	(0.2)	(0.0)	0.0	(0.0)	0.0	0.0
GLOBAL INFLATION LINKEI	$ 842,418,503	2.6%	(0.0)	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	(0.0)	(0.4)	0.0	0.0	(0.0)	(0.0)	(0.1)	(0.2)
GTAA	$ 3,625,924,892	11.1%	(1.9)	(0.6)	(0.9)	(0.7)	(0.8)	(1.4)	(1.2)	0.7	0.6	0.1	0.4	(0.8)	(2.7)	(1.5)	(0.3)	(0.0)	0.0	(0.2)	(0.4)
GRAND TOTAL	**$ 32,712,474,446**	**100.0%**	**(17.3)**	**(4.8)**	**(5.6)**	**(6.0)**	**(7.1)**	**(12.5)**	**(9.7)**	**6.7**	**6.5**	**1.2**	**3.3**	**(7.1)**	**(23.2)**	**(13.0)**	**(0.9)**	**(0.0)**	**0.1**	**(1.0)**	**(2.6)**
INTERIM POLICY BENCHMARK			**(15.4)**	**(4.5)**	**(6.1)**	**(5.7)**	**(6.2)**	**(11.9)**	**(8.0)**	**6.8**	**6.7**	**1.0**	**3.2**	**(6.2)**	**(20.8)**	**(11.6)**	**(1.4)**	**(0.0)**	**0.2**	**(1.1)**	**(2.9)**



GLOSSARY	DEFINITION	INTERPRETATION
Historical VaR 95%	A risk metric that is derived from a full revaluation historical simulation of the risk factors impacting a portfolio, making no assumption of the tail distribution, and reporting the largest loss likely to be suffered over a holding period (1Month for ASRS) 5 times out of 100, or 1 month out of 20	Value at Risk is a number, measured in price units or as percentage of portfolio value, which tells you that in a defined large percentage of cases (usually 95% or 99%) your portfolio is likely to not lose more than that amount of money. Or said the other way around, in a defined small percentage of cases (5% or 1%) your loss is expected to be greater than that number.
HVaR Contri 95%	This is the decomposition of the VaR, making it an additive measure, showing positive values where risk is decreased and correlations are negative.	
HVaR Contri % to Total	This is the VaR contribution displayed in percent.	
Parametric VaR 95%	A risk metric that is derived from a full revaluation historical simulation of the risk factors impacting a portfolio, making a Normal distribution assumption of the tail distribution, and reporting the largest loss likely to be suffered over a holding period (1Month for ASRS) 5 times out of 100, or 1 month out of 20.	Value at Risk is a number, measured in price units or as percentage of portfolio value, which tells you that in a defined large percentage of cases (usually 95% or 99%) your portfolio is likely to not lose more than that amount of money. Or said the other way around, in a defined small percentage of cases (5% or 1%) your loss is expected to be greater than that number.
PVaR Contri 95%	This is the decomposition of the VaR, making it an additive measure, showing positive values where risk is decreased and correlations are negative.	
PVaR Contri % to Total	This is the VaR contribution displayed in percent.	
Exp Tail Loss 95%	Also known as Conditional VaR or ETL, it is derived by taking a weighted average between the VaR and losses exceeding the VaR. If VaR is reported at 95.0%, then ETL will average the losses between 95.1% to 99.9%. It is a risk measure that assesses the risk beyond VaR and into the tail end of the distribution of loss.	A measure that produces better incentives for traders than VaR is expected shortfall. This is also sometimes referred to as Conditional VaR, or tail loss. Where VaR asks the question 'how bad can things get?', expected shortfall asks 'if things do get bad, what is our expected loss?'
Exp Tail Loss Contri 95%	This is the decomposition of the ETL making it an additive measure, showing positive values where risk is decreased and correlations are negative.	
Exp Tail Loss Contri % to Total	This is the ETL contribution displayed in percent.	
Max Loss	The maximum projected loss.	
Downside Risk (8.7%)	A risk metric that distinguishes between "good" and "bad" returns by assigning risk only to those returns below a return specified by an investor. Downside risk is considered a more effective risk measure than standard deviation (volatility) for two important reasons: 1) it is investor specific, and 2) it identifies return distributions that have higher probabilities for negative ("left tail") market events. Downside risk is also referred to as downside deviation or target semi-deviation.	A 5 % downside risk with an 8.7% MAR means that the conditional average underperformance (below 8.7% annual) is 5%, adjusted for a positive skew (greater than the MAR). Effectively, downside risk amplifies a big loss (by squaring the distance of that loss to the target) and smoothes out the risk measure by taking into account the gains setting them up to be equal to the target MAR.
Downside Risk Contri (8.7%)	This is the decomposition of the downside risk, making it an additive measure, showing positive values where risk is decreased and correlations are negative.	
Downside Risk Contri (8.7%) to Total	This is the downside risk contribution displayed in percent.	

Securities Lending Risk Metrics

	2 – Year Swap Spread (bps)	Domestic Bank Credit Default Swap (bps)	5-Year Financial OAS (bps)	TED Spread (bps)	CBOE VIX Index (vol)	Windham Systemic Risk	Windham Turbulence
3/31/2014	13	68	103	20	14	Low	Low
2/28/2014	13	72	104	19	14	Low	Low
1/31/2014	13	85	111	22	18	Low	Low
12/31/2013	11	72	109	18	14	Low	Low
11/30/2013	9	79	118	18	14	Low	Low
10/31/2013	12	94	125	21	14	Low	Moderate
9/30/2013	14	106	139	24	17	Low	Moderate
8/31/2013	16	108	142	24	17	Low	High
7/31/2013	17	108	142	23	13	Low	High
6/30/2013	16	129	158	24	17	Low	High
5/31/2013	16	98	134	25	16	Low	Moderate
4/30/2013	14	107	137	23	14	Low	Moderate
3/31/2013	18	116	142	21	13	Low	Low
2/28/2013	15	111	141	18	16	Low	Low
1/31/2013	17	112	146	23	14	Low	Low
12/31/2012	14	129	155	27	18	Low	Low
11/30/2012	12	144	163	23	16	Low	Moderate
10/31/2012	10	153	158	21	19	Low	Moderate
9/30/2012	13	167	179	27	16	Low	Moderate
8/31/2012	18	201	206	35	17	Low	High
7/31/2012	20	222	223	35	19	Low	High
6/30/2012	25	234	253	38	17	Low	Moderate
5/31/2012	35	271	272	40	24	Low	Moderate
4/30/2012	29	221	239	37	17	Low	Moderate
3/31/2012	25	192	227	40	16	Low	Moderate
2/29/2012	26	208	245	41	18	Low	Moderate
1/31/2012	30	216	278	49	19	High	Moderate
12/31/2011	48	289	337	57	23	High	Moderate
11/30/2011	42	323	349	53	28	High	Moderate
10/31/2011	33	234	281	44	30	High	Moderate
9/30/2011	33	306	332	35	43	High	Moderate
8/31/2011	30	199	279	32	32		
7/31/2011	23	143	197	16	25		
6/30/2011	24	128	187	24	17		

	RISK FACTORS	Green	Yellow	Red
1	2 – Year Swap Spread	< 40 bps	40 - 60 bps	> 60 bps
2	Bank Credit Default Swap	< 100 bps	100 - 200 bps	> 200 bps
3	5-Year Financial OAS	< 125 bps	125 - 200 bps	> 200 bps
4	TED Spread	< 50 bps	50 - 100 bps	> 100 bps
5	CBOE VIX Index	< 25 Vol	25 - 35 Vol	> 35 Vol
6	Windham Systemic Risk	Low	n/a	High
7	Windham Turbulence	Low	Moderate	High

LEGEND

2 – Year Swap Spread	The spread paid by the fixed-rate payer of an interest rate swap over the rate of the 2-year Treasury. The reported 2-year swap spread from Bloomberg is a composite price - calculated average of best bid/ask pricing.
Bank Credit Default Swap	Average of major domestic bank Credit Default Swap rates with five year tenor. The average includes Citigroup, JPMorgan, Goldman Sachs, Morgan Stanley, Wells Fargo and Bank of America.
5-Year Financial OAS	The Barclay's U.S. Aggregate Financial Average Option Adjusted Spread; the option adjusted investment grade financial corporate bond spread over 5-year Treasury bonds.
TED Spread	The TED Spread is calculated as the difference between three-month LIBOR expressed in USD and the corresponding yield on 3-month Treasury Bills, expressed in basis points.
CBOE VIX Index	The Chicago Board Options Exchange VIX Index measures the weighted average implied volatility of the S&P 500 using call and put prices over the front two months with a wide range of strike prices.
Windham Systemic Risk	Windham Capital's proprietary measure of the extent to which markets are unified or tightly coupled, called the absorption ratio. When markets are tightly coupled, they are more fragile and negative shocks propagate more quickly and broadly than when markets are loosely linked. Windham reports Systemic Risk as High or Low; there is no Moderate designation for Systemic Risk.
Windham Turbulence	Windham Capital's proprietary measure of the statistical unusualness of a set of returns given their historical pattern of behavior; including extreme price moves, decoupling of correlated assets and convergence of uncorrelated assets. Windham reports Turbulence as High, Moderate, or Low.

NEPC, LLC

To: The Arizona State Retirement System (ASRS) Investment Committee (IC)

From: Mr. Allan Martin, Partner, Consultant, NEPC

Mr. Dan LeBeau, Consultant, NEPC

Date: April 14, 2014

Subject: Agenda Item #5: Presentation, Discussion and Appropriate Action Regarding Independent Reporting, Monitoring and Oversight of the ASRS Investment Program

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Purpose

To present and discuss information regarding the independent reporting, monitoring and oversight of the ASRS Investment Program.

Recommendation

Informational only; no action required.

Background

NEPC is responsible for providing an independent reporting, monitoring and oversight function from the Investment Program information which is presented by the CIO and IMD.

As a result, NEPC has developed reports for both the IC and Board designed to 1) provide the appropriate level of investment information for the purposes of independent oversight (ASRS SAAP compliance, Asset Class Committee minutes review, investment selection due diligence packet compliance, etc.); 2) provide ASRS investment program performance relative to its goals/objectives (presented quarterly); and 3) communicate NEPC's perspectives on the market environment, investment outlook or other initiatives or topics they believe are important to convey to the IC.

As of April 4, 2014, the Total Fund's market value was approximately $33.3 billion.

Attachments:

- NEPC's Independent Reporting, Monitoring and Oversight reports

Arizona State Retirement System

Independent ASRS Investment Program Oversight

April 21, 2014

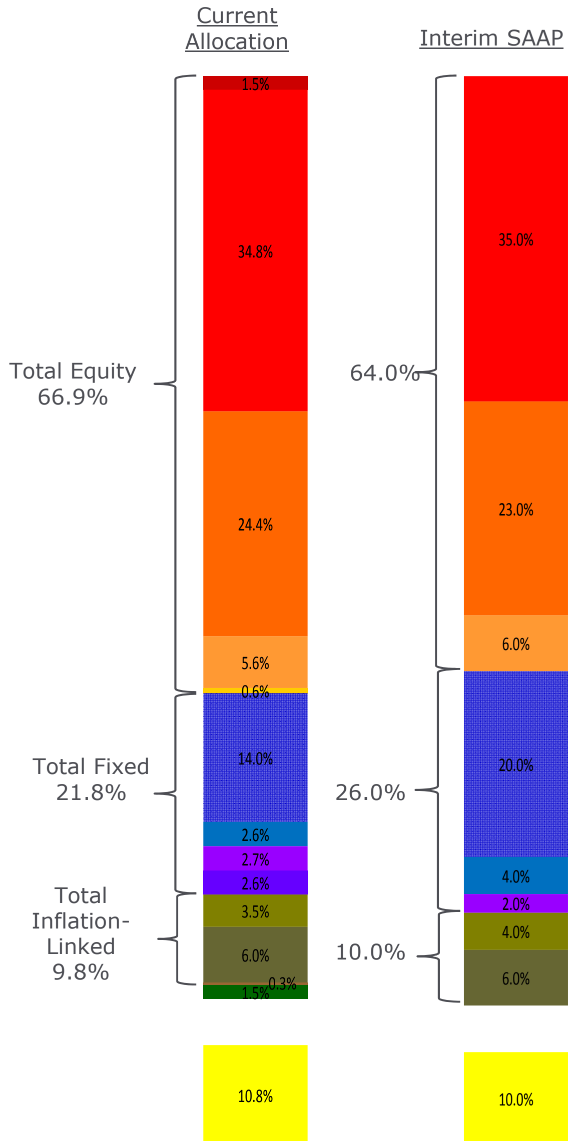
Allan Martin, Partner, NEPC
Dan LeBeau, Consultant, NEPC

NEPC, LLC

Contents

Independent Oversight/Compliance

SAA Policy Compliance



	Current Mkt Value	Current Allocation	Interim SAAP	Difference	Policy Range	Within Range
Total Domestic and International Equity[1]	$20,240,258,605	60.7%	58.0%	2.7%		
Domestic Equity[3]	$11,614,480,099	34.8%	35.0%	-0.2%	26% - 38%	Yes
U.S. Large Cap[2]	*$8,480,368,440*	*25.4%*	*25.0%*	*0.4%*		
U.S. Mid Cap	*$1,575,493,548*	*4.7%*	*5.0%*	*-0.3%*		
U.S. Small Cap	*$1,558,618,111*	*4.7%*	*5.0%*	*-0.3%*		
International Equity[3]	$8,135,298,214	24.4%	23.0%	1.4%	16% - 28%	Yes
Developed Large Cap[2]	*$4,944,114,488*	*14.8%*	*14.0%*	*0.8%*		
Developed Small Cap	*$1,295,635,556*	*3.9%*	*3.0%*	*0.9%*		
Emerging Markets	*$1,895,548,170*	*5.7%*	*6.0%*	*-0.3%*		
Private Equity[4]	$1,866,861,260	5.6%	6.0%	-0.4%	5% - 9%	Yes
Opportunistic Equity[4,6]	$184,900,337	0.6%	0.0%	0.6%	0% - 3%	Yes
Total Equity	$22,292,020,202	66.9%	64.0%	2.9%	53% - 70%	Yes
U.S. Fixed Income	$4,653,434,291	14.0%	20.0%	-6.0%	8% - 28%	Yes
Core[2]	*$3,423,983,028*	*10.3%*	*15.0%*	*-4.7%*		
High Yield	*$1,229,451,263*	*3.7%*	*5.0%*	*-1.3%*		
Emerging Market Debt	$877,707,957	2.6%	4.0%	-1.4%		
Private Debt[4]	$886,573,434	2.7%	2.0%	0.7%		
Opportunistic Debt[4,6]	$857,516,645	2.6%	0.0%	2.6%	0% - 10%	Yes
Total Fixed Income	$7,275,232,327	21.8%	26.0%	-4.2%	15% - 35%	Yes
Commodities[2]	$1,169,586,890	3.5%	4.0%	-0.5%	1% - 7%	Yes
Real Estate[2,4]	$2,016,124,498	6.0%	6.0%	0.0%	6% - 10%	Yes
Infrastructure	$0	0.0%	0.0%	0.0%	0% - 3%	Yes
Farmland and Timber	$92,404,140	0.3%	0.0%	0.3%	0% - 3%	Yes
Opportunistic Inflation-Linked[5]	$0	0.0%	0.0%	0.0%	0% - 3%	Yes
Total Inflation-Linked	$3,278,115,528	9.8%	10.0%	-0.2%	8% - 16%	Yes
Cash[5]	$496,196,710	1.5%	0.0%	1.5%		
Total	$33,341,564,767	100.0%	100.0%	0.0%		

[1]Total Domestic and International Equity includes Equity Risk Factor Portfolio with assets of $490.5 million.

[2]GTAA allocation distributed into U.S. Large Cap Equity, Developed Large Cap Equity, Core Fixed Income, Commodities and Real Estate.

[3]U.S. and Non-U.S. Equity includes residual values remaining in terminated manager accounts.

[4]Values shown for private markets portfolios include cash flows that occurred during 1Q2014.

[5]Cash includes money for the upcoming monthly pension distribution. Value shown also includes assets in liquidating GTAA account.

[6]Aggregate Opportunistic asset classes not to exceed 10%.

Note: Interim SAA Policy includes proration of 1% Private Equity, 1% Private Debt and 2% Real Estate, which are unfunded. Policy Ranges shown are relative to the long-term SAAP, causing 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 April 4, 2014. Data shown above will differ from what is presented in the 1Q 2014 Board Report that is scheduled to be presented at the June 27, 2014 Board meeting.

Market values include manager held cash.

Asset Class Committee Monitoring

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

- **February 21, 2014 – Private Markets Committee**
  - Review of Private Markets Program Staff Report
  - General Discussion on Future Agenda Items and Deal Flow
  - Private Equity Manager Recommendation ($75 million)
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 7%)
    - The ASRS has invested with this manager in a prior fund and has also approved co-investment with this manager and is in the process of finalizing the legal documents to begin co-investing.
    - Due diligence process was followed in accordance with SIP006 – Investment Manager, Partner, and Co-Investment Selection and Oversight.
    - Committee approved the recommendation.
  - Private Equity Manager Recommendation ($50 million)
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 7%)
    - The ASRS has 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.

- **February 21, 2014 – Private Markets Committee (continued)**
  - Niche and Tactical Real Estate Discussion
    - The Committee previously approved a $350 million program of niche and tactical real estate investments and authorized RCLCO, the Plan's real estate advisor, to develop a detailed plan for implementation and a preliminary pipeline.
    - The Committee authorized the ASRS private markets team and RCLCO to proceed with implementation of the niche and tactical real estate program over what is estimated to be a two year period.
      - There is no requirement to invest the entire $350 million.
      - Investments will be approved in a two-step process by the PRIVMC, first as a preliminary presentation and second, if further work is authorized, as a final, more detailed presentation.
      - Several specific investment criteria were established, subject to modifications, including expected return targets, minimum size of investments, location of investments (all U.S.), use of leverage (65% max), the structure of the investments and additional partners.
      - A financial reporting and monitoring process will be established.
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Real Estate is 8%)
  - Residential Land Discussion
    - The 2014 real estate pacing and implementation plan included a recommendation from RCLCO for the ASRS to consider investments in residential land as an opportunistic equity investment.
      - The recommendation was not approved, but the Committee authorized RCLCO to perform additional work on the topic to provide a more detailed explanation of the market opportunity.
    - The Committee authorized the ASRS private markets team and RCLCO to proceed with implementation of the residential land strategy to invest $100 million.
      - There is no requirement to invest the entire $100 million. Program is designed to return all capital within three years.
      - Investments will be approved in a two-step process by the PRIVMC, first as a preliminary presentation and second, if further work is authorized, as a final, more detailed presentation.
      - Several specific investment criteria were established, subject to modifications, including expected return targets, minimum size of investments, location of investments (all U.S.) and geographic diversification, use of leverage (50% max for any one property; 30% max at the portfolio level), the structure of the investments and additional partners.
      - A financial reporting and monitoring process will be established.
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Opportunistic Equity is 0% with a range of 0-3%)

Asset Class Committee Monitoring

- **March 24, 2014 – Private Markets Committee**
  - Review of Private Markets Program Staff Report
  - General Discussion on Future Agenda Items and Deal Flow
  - Private Equity Manager Recommendation ($75 million)
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 7%)
    - Due diligence process was followed in accordance with SIP006 – Investment Manager, Partner, and Co-Investment Selection and Oversight.
    - Committee approved the recommendation.
  - Private Equity Manager Recommendation ($50 million)
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Private Equity is 7%)
    - Due diligence process was followed in accordance with SIP006 – Investment Manager, Partner, and Co-Investment Selection and Oversight.
    - Committee approved the recommendation.

- **March 27, 2014 – Public Markets Committee**
  - Review of Public Equity Program Staff Report
  - Non-U.S. Developed Markets Large Cap Equity Re-Structure and Manager Recommendation ($1.0 billion)
    - Staff recommended the termination of three non-U.S. developed markets large cap equity managers and to transition those assets to three new managers, with a residual amount ($5 million) allocated to the remaining active manager (Brandes).
      - New managers are growth ($525 million), concentrated core ($350 million) and value ($155 million) strategies to complement the existing value portfolio managed by Brandes ($523 million).
    - Consistent with strategic plan at the Total Fund level (SAAP Target to Int'l Dev. Mkts Large Cap is 14%)
    - 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 toward the long-term SAAP.**
  – Full implementation results in a further reduction of 2% within U.S. Equities and 2% within U.S. Core Fixed Income and an increase of 1% to Private Equity, 1% to Private Debt, and 2% to Real Estate.

- **The restructuring of non-U.S. developed markets large cap equity allocation eliminates three underperforming actively managed strategies and replaces them with three new actively managed strategies.**
  – Goal of smoothing the volatility and return profile of the Fund's allocation to non-U.S. developed markets equities as the existing managers had experienced unusually large tracking error and poor relative performance over the short to intermediate term, which negated all of the value add that had been added relative to respective benchmarks since their inception.
  – Fees for new structure are commensurate with fees for prior structure.

- **$250 million in commitments to Private Equity strategies in line with strategic plan and pacing model for the asset class.**

- **$100 million commitment to Opportunistic Equity strategy increases total commitments to Opportunistic asset classes to $2.1 billion, or approximately 6.2% of the Total Fund. Aggregate Opportunistic asset classes are not to exceed 10% per the SAAP.**
  – Total $475 million in commitments to Opportunistic Equity strategies = 1.4% of the Total Fund (SAAP Target to Opportunistic Equity is 0% with a range of 0-3%).
  – Total $1.6 billion in commitments to Opportunistic Debt strategies = 4.8% of the Total Fund (SAAP Target to Opportunistic Debt is 0% with a range of 0-10%).
  – Current actual exposure to Opportunistic investments is 3.2% of the Total Fund, which is largely comprised of investment in Opportunistic Debt strategies.

General Observations

- **Tactical positioning consistent with IMD House Views**
  - IMD has been tactically reducing exposure to both U.S. and non-U.S. equities based on a recognition that in the short-term, valuations are near highs but are not overextended.
    - Actual exposure to U.S. and Non-U.S. equities (excluding GAA exposure) is currently below target allocations to each asset class.
      - U.S. Equity – 31.5% actual vs. 33% SAAP target; Non-U.S. Equity – 21.4% actual vs. 23% SAAP target.
    - NEPC has been recommending similar action as we have reduced expectations for U.S. and non-U.S. equities after a significant run in equities during 2013.
  - A portion of the underweight to public equities is offset by an increase in core fixed income exposure.
    - IMD has re-engaged BlackRock to passively manage core fixed income assets for the Fund and allocated $400 M to BlackRock in early April.
    - NEPC outlook for core fixed income is more positive than prior years as upward pressure on interest rates appears to have subsided.
  - IMD maintains an underweight position in both Emerging Markets Debt and Equities.
    - In late September 2013, a concern about potential further deterioration in EM currencies resulted in a reduction in Emerging Market Debt (2.6% actual vs. 4.0% target currently).
    - With regard to emerging markets equities, the slight underweight (5.7% actual vs. 6.0% target currently) remains; returns of equities within emerging markets appear to be less impacted by changes in the value of emerging market currencies compared to local currency debt.
    - NEPC believes client's should maintain a long-term commitment to emerging markets, though we recognize there could be considerable volatility in the short-term.
  - $1.8 billion in commitments to private debt strategies equates to approximately 5.4% of Total Fund assets vs. the SAAP Target of 3%.
    - Overweight to private debt asset class is consistent with current IMD views of where opportunities are within fixed income markets and is consistent with NEPC views.

Market Environment Update

Investment Market Update: As of March 31, 2014

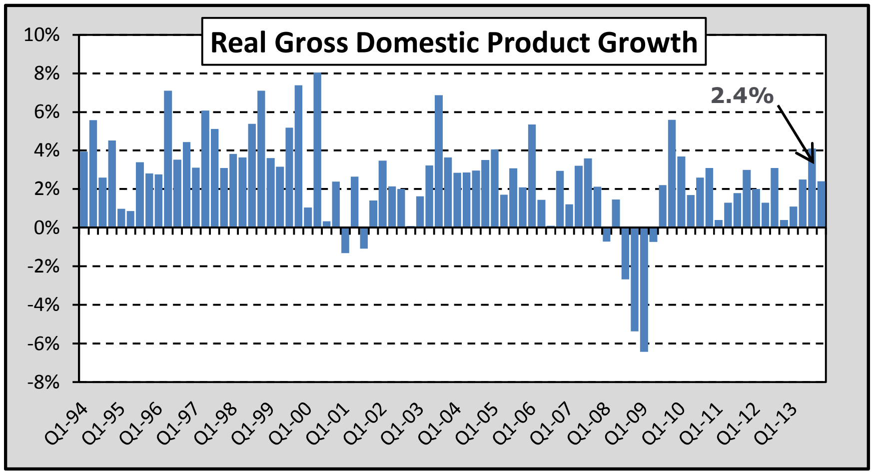
PERFORMANCE THROUGH 3/31/2014

Sector	Index	2008	2009	2010	2011	2012	2013	Jan	Feb	Mar	2014
Treasury STRIPS	Barclays US Strips 20+ Yr	59.5%	-36.0%	10.9%	58.5%	3.0%	-21.0%	9.4%	1.2%	1.7%	12.7%
REITS	Wilshire US REIT	-39.2%	28.6%	28.6%	9.2%	17.6%	1.9%	3.9%	5.0%	0.9%	10.1%
Commodities	DJ UBS Commodity	-35.6%	18.9%	16.8%	-13.3%	-1.1%	-9.5%	0.3%	6.2%	0.4%	7.0%
Long Govt/Credit	Barclays US Govt/Credit Long	8.4%	1.9%	10.2%	22.5%	8.8%	-8.8%	4.0%	1.7%	0.8%	6.6%
Long Credit	Barclays US Long Credit	-3.9%	16.8%	10.7%	17.1%	12.7%	-6.6%	3.3%	2.1%	0.8%	6.3%
Muni Bonds	Barclays Municipal	-2.5%	12.9%	2.4%	10.7%	6.8%	-2.6%	1.9%	1.2%	0.2%	3.3%
Large Cap Value	Russell 1000 Value	-36.8%	19.7%	15.5%	0.4%	17.5%	32.5%	-3.6%	4.3%	2.4%	3.0%
High Yield	Barclays US Corp High Yield	-26.2%	58.2%	15.1%	5.0%	15.8%	7.4%	0.7%	2.0%	0.2%	3.0%
EMD USD	Barclays EM USD Aggregate	-14.7%	34.2%	12.8%	7.0%	17.9%	-4.1%	-0.3%	2.3%	0.8%	2.8%
Global Bonds	Citi WGBI	10.9%	2.6%	5.2%	6.4%	1.6%	-4.0%	1.3%	1.4%	-0.1%	2.7%
SMID Cap	Russell 2500	-36.8%	34.4%	26.7%	-2.5%	17.9%	36.8%	-2.3%	5.1%	-0.4%	2.3%
Diversified	Diversified*	-24.5%	24.1%	13.5%	1.3%	12.7%	17.6%	-1.5%	3.4%	0.3%	2.1%
Large Cap	Russell 1000	-37.6%	28.4%	16.1%	1.5%	16.4%	33.1%	-3.2%	4.7%	0.6%	2.0%
EMD Local	JPM GBI EM Global Diversified	-5.2%	22.0%	15.7%	-1.8%	16.8%	-9.0%	-4.6%	3.9%	2.8%	1.9%
Core Bonds	Barclays US Agg Bond	5.2%	5.9%	6.5%	7.8%	4.2%	-2.0%	1.5%	0.5%	-0.2%	1.8%
Large Cap	S&P 500	-37.0%	26.5%	15.1%	2.1%	16.0%	32.4%	-3.5%	4.6%	0.8%	1.8%
Small Cap Value	Russell 2000 Value	-28.9%	20.6%	24.5%	-5.5%	18.1%	34.5%	-3.9%	4.6%	1.2%	1.8%
Interm Core Bonds	Barclays US Agg Interm	4.9%	6.5%	6.1%	6.0%	3.6%	-1.0%	1.1%	0.4%	-0.3%	1.2%
Large Cap Growth	Russell 1000 Growth	-38.4%	37.2%	16.7%	2.6%	15.3%	33.5%	-2.9%	5.1%	-1.0%	1.1%
Small Cap	Russell 2000	-33.8%	27.2%	26.9%	-4.2%	16.3%	38.8%	-2.8%	4.7%	-0.7%	1.1%
Interm Govt/Credit	Barclays US Govt/Credit Interm	5.1%	5.2%	5.9%	5.8%	3.9%	-0.9%	0.9%	0.4%	-0.3%	1.0%
Int'l Developed	MSCI EAFE	-43.4%	31.8%	7.8%	-12.1%	17.3%	22.8%	-4.0%	5.6%	-0.6%	0.7%
Small Cap Growth	Russell 2000 Growth	-38.5%	34.5%	29.1%	-2.9%	14.6%	43.3%	-1.7%	4.8%	-2.5%	0.5%
Govt/Credit	Barclays Govt/Credit 1-5 Yr	5.1%	4.6%	4.1%	3.1%	2.2%	0.3%	0.4%	0.2%	-0.3%	0.4%
Govt/Credit	Barclays US Govt/Credit 1-3 Yr	5.0%	3.8%	2.8%	1.6%	1.3%	0.6%	0.2%	0.1%	-0.1%	0.2%
Emerging Equities	MSCI EM	-53.3%	78.5%	18.9%	-18.4%	18.2%	-2.6%	-6.5%	3.3%	3.1%	-0.4%

* 35% LC, 10% SC, 12% Intl Equity, 3% Emerging Equity, 25% Core Bonds, 5% HY, 5% Global Bonds, 5% REITS

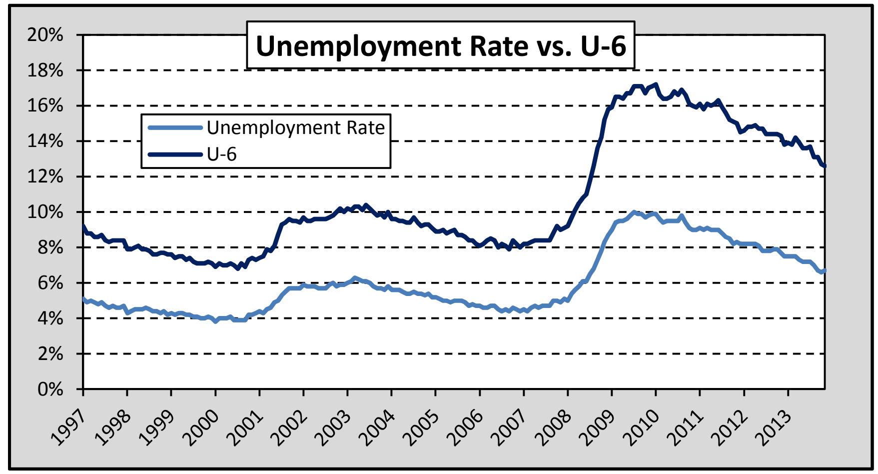
Source: Morningstar Direct

U.S. Economic Environment



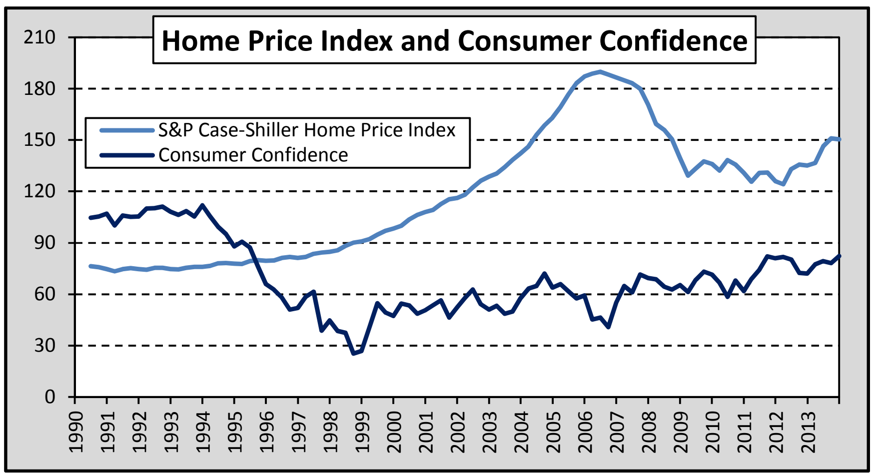
'Third' estimate of 4Q 2013 GDP growth was revised downward to 2.4%; 3Q 2013 GDP growth was 4.1%)

Source: Bloomberg as of 3/31



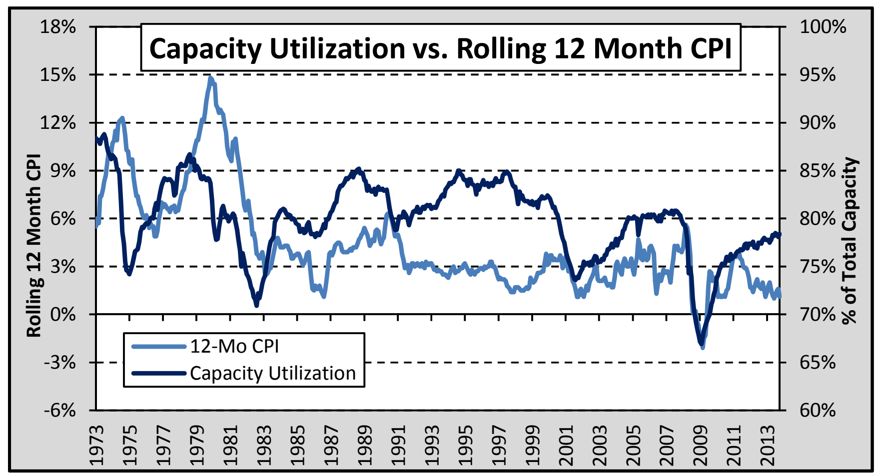
Unemployment remained at 6.7% in March; U-6 remained at 12.6%

Source: Bloomberg as of 3/31



Consumer confidence fell to 82.3 in March; the Case-Shiller home price index (as of 12/31) dipped slightly to 150.39 from its highest level (150.92) since the financial crisis

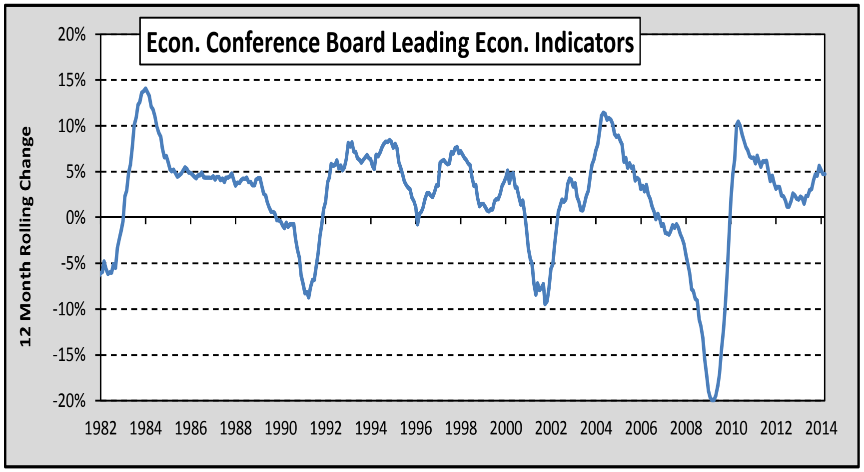
Source: Bloomberg as of 3/31



Rolling 12 month CPI decreased to 1.1% at the end of February; capacity utilization rose slightly to 78.4% in the month

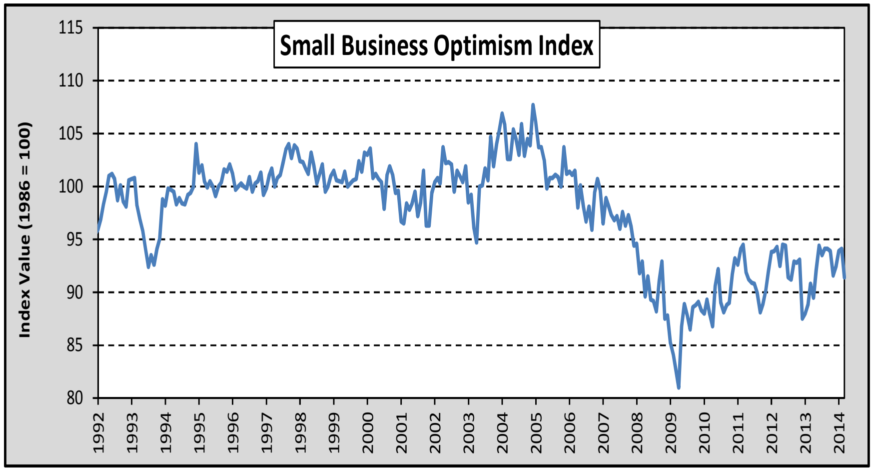
Source: Bloomberg as of 2/28

Key Economic Indicators



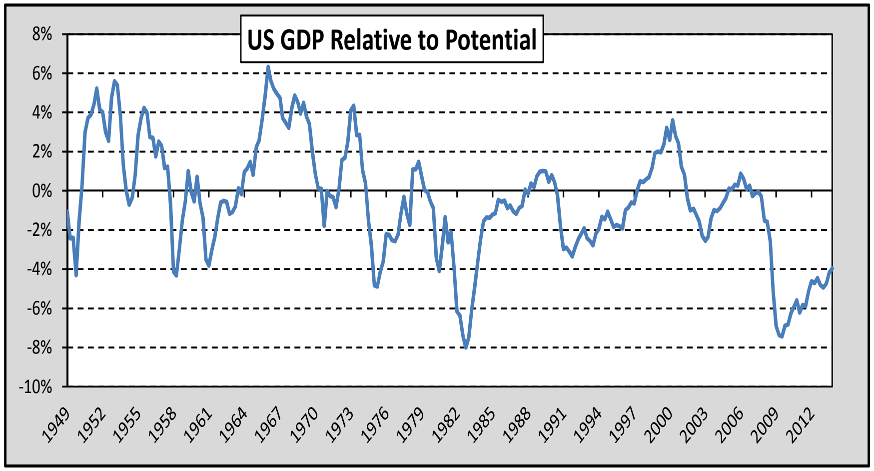
The rolling percentage change in the Leading Economic Indicators index decreased to 4.72% through February

Source: Bloomberg as of 2/28



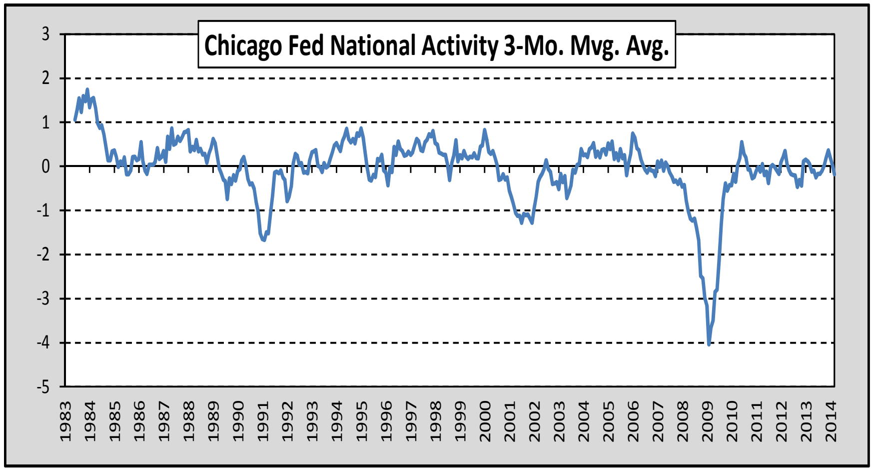
The small business optimism index decreased to 91.4 through February

Source: Bloomberg as of 2/28



U.S. GDP relative to potential GDP rose slightly through Q3 but remained near historic lows

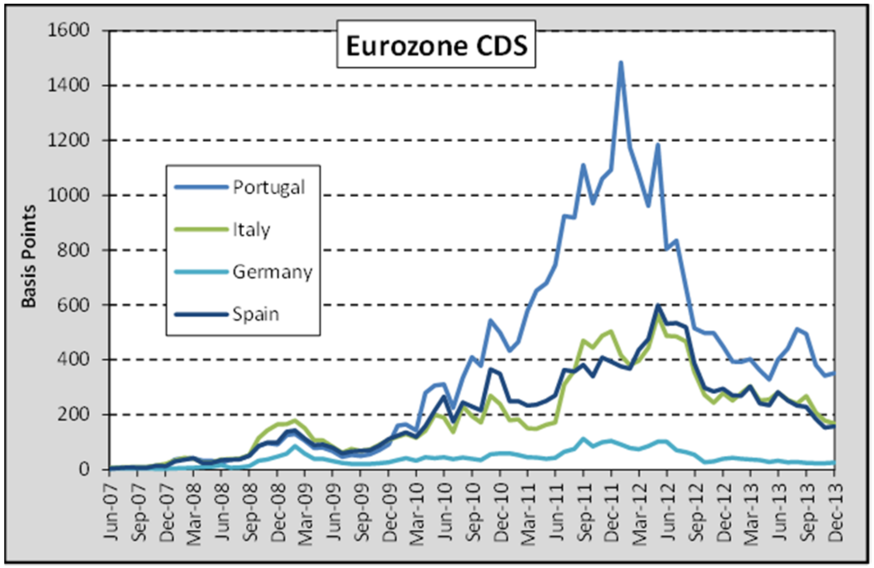
Source: Bureau of Economic Analysis, Congressional Budget Office as of 10/1



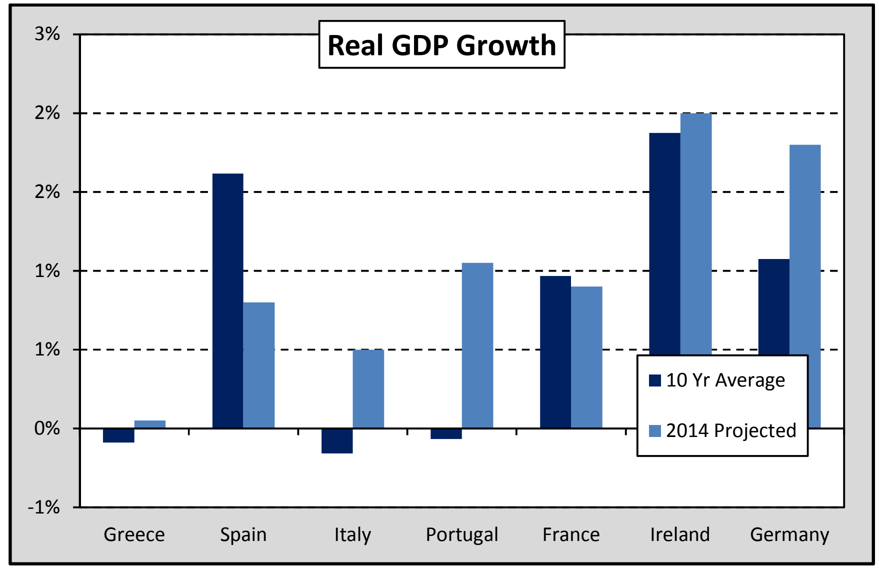
Chicago Fed National Activity 3 Month moving average turned negative through February, indicating below average growth

Source: Bloomberg as of 2/28

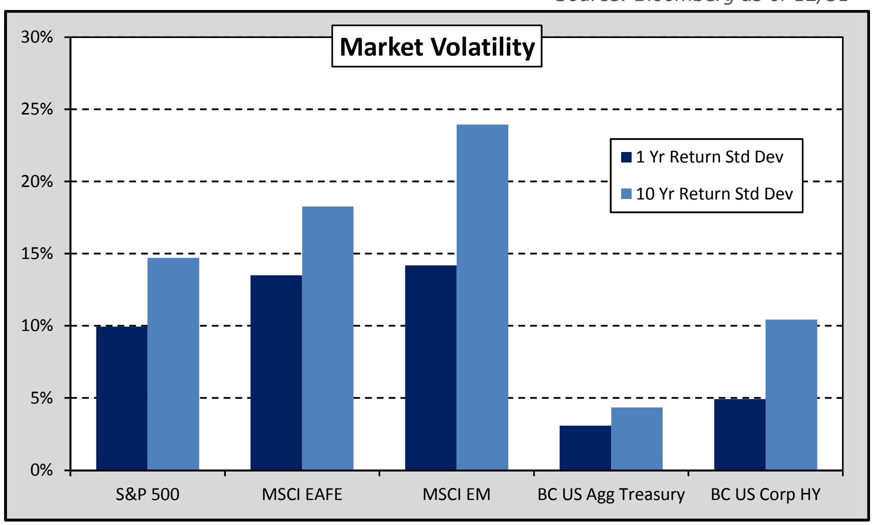
Looming Macro Uncertainties



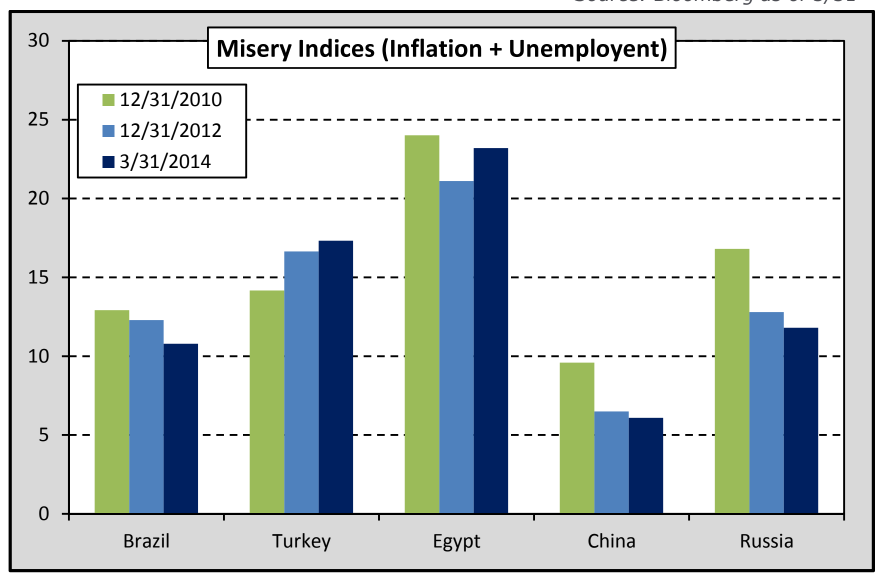
Source: Bloomberg as of 12/31



Source: Bloomberg as of 3/31



Source: Morningstar as of 3/31



Source: Bloomberg as of 3/31

NEPC UPDATES

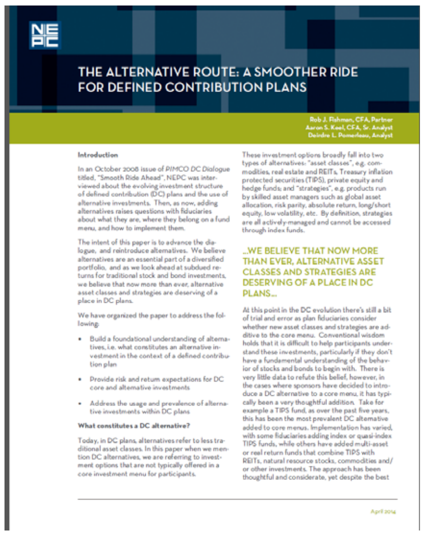
First Quarter 2014

Highlights of first quarter happenings at NEPC

NEPC Research

Recent White Papers posted

- 4Q Market Thoughts—"1997, 2007, or Something Else Altogether?" (January 2014)
- Moving in Different Directions: NEPC's 2014 Asset Allocation Letter (January 2014), *NEPC's Asset Allocation Committee*
- Annual Chairman's Letter (March 2014), *Richard M. Charlton, Chairman*
- Overlay Strategies: Increasing Portfolio Diversification Through Derivatives (March 2014), *Brian Roberts, CAIA, Senior Consultant*
- The Alternative Route: A Smoother Ride for Defined Contribution Plans (April 2014), *Rob J. Fishman, FA, Partner; Aaron S. Keel, CFA, Senior Analyst; Deirdre L. Pomerleau, Analyst*



THE ALTERNATIVE ROUTE: A SMOOTHER RIDE FOR DEFINED CONTRIBUTION PLANS

Rob J. Fishman, CFA, Partner
Aaron S. Keel, CFA, Sr. Analyst
Deirdre L. Pomerleau, Analyst

Introduction

...WE BELIEVE THAT NOW MORE THAN EVER, ALTERNATIVE ASSET CLASSES AND STRATEGIES ARE DESERVING OF A PLACE IN DC PLANS...

What constitutes a DC alternative?

April 2014

NEPC's 19th Annual Client Conference

- May 13 and May 14, 2014
- Boston Convention Center
- Headline Speakers:
  - David M. Rubenstein, Co-Founder and Co-CEO, The Carlyle Group
  - Perry M. Traquina, CFA, Chairman and CEO, Managing Partner, Wellington Management Company
- Register at www.nepc.com

Professional Staff Updates

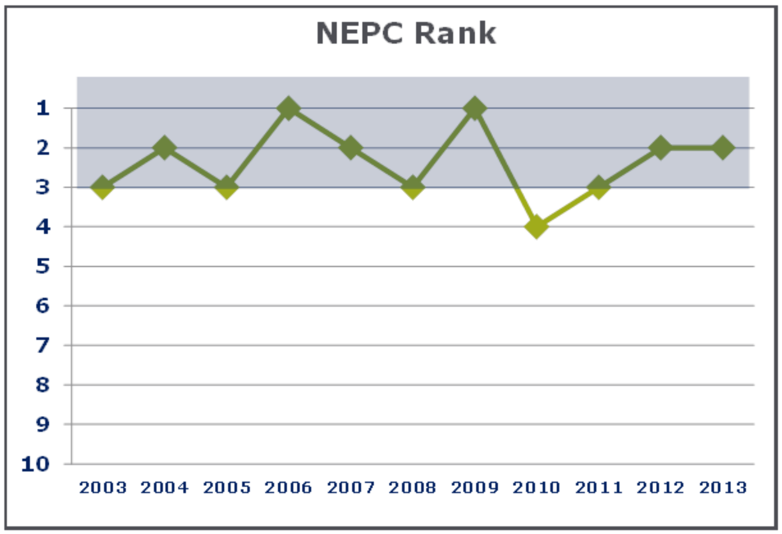
- Tim McCusker, CFA, CAIA, FSA named Chief Investment Officer

Top Three Again!

Thanks to you, our wonderful clients, NEPC has ranked in the Greenwich top three overall for 10 of the past 11 years.

- ***Greenwich Associates surveys ~ 1,000 large fund sponsors every year, regarding 3 broad areas:***
  - *Investment Consulting*
  - *Manager Selection*
  - *Client Servicing*

- ***NEPC is recognized for industry-leading stability and excellence:***
  - *Ranked #2 overall in 2013 and 2012**
  - *One of only two firms to rank in the top three in nine of the last 10 years**
  - *Ranked #1 for proactive advice and innovative ideas in nine of the last 11 years**
  - *Ranked #1 for long-term asset allocation in six of the last 11 years and ranked top three in 10 of the last 11 years**



NEPC 2013 Ranking among 10 Largest Consulting Firms	
Category	Rank
Understanding Goals and Objectives	#1
Long-term Asset Allocation	#1
Proactive Advice and Innovative Ideas	#1
Capability of Consultant Assigned to Fund	#1
Credibility with Investment Committee	#1
Knowledge of Investment Managers	#1

* Rankings versus 10 largest consulting firms
Greenwich Associates is an independent research firm that interviews fund sponsors. Their rankings do not represent an endorsement of any consulting firm.

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 – Present – 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**

- *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)/15% Barclays Capital Aggregate/5% Barclays Capital High Yield/4% JP Morgan GBI-EM Global Diversified/2% S&P/LSTA Levered Loan Index + 250 basis points (lagged one quarter)/6% NCREIF ODCE (lagged one quarter)/4% Dow Jones/UBS Commodities Index

Note: Interim SAA Policy includes a proration of 1% Private Equity, 1% Private Debt, and 2% Real Estate, which are unfunded. Private Equity was prorated to domestic equity; Real Estate was prorated to domestic equity, international equity, fixed income and commodities; Private Debt was prorated to fixed income. Recently approved Strategic Asset Allocation Policy effective July 1, 2012.

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

Information Disclosure

- **NEPC uses, as its data source, the plan's custodian bank or fund service company, and NEPC relies on those sources for security pricing, calculation of accruals, and all transactions, including income payments, splits, and distributions. While NEPC has exercised reasonable professional care in preparing this report, we cannot guarantee the accuracy of all source information contained within.**

- **The Investment Performance Analysis (IPA) is provided as a management aid for the client's internal use only. Portfolio performance reported in the IPA does not constitute a recommendation by NEPC.**

- **Information in this report on market indices and security characteristics is received from sources external to NEPC. While efforts are made to ensure that this external data is accurate, NEPC cannot accept responsibility for errors that may occur.**

ARIZONA STATE RETIREMENT SYSTEM

3300 NORTH CENTRAL AVENUE • PO BOX 33910 • PHOENIX, AZ 85067-3910 • PHONE (602) 240-2000
7660 EAST BROADWAY BOULEVARD • SUITE 108 • TUCSON, AZ 85710-3776 • PHONE (520) 239-3100
TOLL FREE OUTSIDE METRO PHOENIX AND TUCSON 1 (800) 621-3778
EMAIL ADDRESS: ASKMAC@AZASRS.GOV • WEB ADDRESS: WWW. AZASRS.GOV

Paul Matson
Director

MEMORANDUM

TO: The Arizona State Retirement System (ASRS) Investment Committee (IC)

FROM: Mr. Gary R. Dokes, Chief Investment Officer (CIO)
Mr. Dave Underwood, Assistant Chief Investment Officer
Mr. Keith Guido, Assistant Portfolio Manager of Public Equity
Mr. Karl Polen, Head of Private Markets Investing

DATE: April 21, 2014

RE: **Agenda Item #6**: Presentation, Discussion and Appropriate Action Regarding ASRS Total Equities Asset Class (Public and Privates)

Purpose
To present and discuss ASRS Total Equities Asset Class (Public and Privates)

Recommendation
Information item only; no action required.

Background
As part of the annual asset class presentations to the IC, the CIO, IMD Portfolio Managers and NEPC will review ASRS Total Equity Asset Classes, i.e., program strategies, portfolio structure, performance, etc. In the event detail manager performance or confidential/non-public information is discussed, the IC may move into executive session to discuss such matters.

Regarding this agenda item, pursuant to A.R.S. § 38-431.03(A)(2) and A.R.S. § 38-718(P) notice is hereby given to Trustees of the ASRS Investment Committee and the general public that the ASRS Investment Committee may vote to go into executive session, in the event specific manager data is discussed that is deemed confidential/non-public information.

Attachments:

- Public Equity Asset Class Review
- Private Equity Program Review

IMD - Total Public Equity Asset Class Review

April 21, 2014

Dave Underwood, Assistant Chief Investment Officer
John Doran, Assistant Portfolio Manager
Keith Guido, Assistant Portfolio Manager

Equity Class Status Update ***Subsequent to the 28th February 2014 valuations presented in the review.***

Equity Class Status Update ***Subsequent to the 28th February 2014 valuations presented in the review*****:**

- Between month-end March and 4 April 2014, Equities liquidated $400MN from the Domestic Equities asset class sourced as follows:

			Passive Portion	
Domestic Equities Asset Sub-Class	**Drawdown ($Million)**	**% of Drawdown**	**($ Millions)**	**% of Subclass Draw**
LargeCap	-175	43.75%	-150	85.71%
MidCap	-85	21.25%	-65	76.471%
SmallCap	-140	35.00%	-45	32.143%
Totals	**-400**	**100.00%**	**-260**	**- -**

Contributing portfolios were:

- E2: -$80MN
- E7: -70MN
- Intech: -$10MN
- LSV: -$15MN
- E3: -$32.5MN
- E4: -$32.5MN

- Wellington: -$20MN
- E6: -$45MNM
- Champlain: -$15MN
- DFA (SC): -$ 40MN
- TimesSquare: -$40MN

Equity Class Status Update ***Subsequent to the 28th February 2014 valuations presented in the review*** **(*Cont'd*):**

- At 27th March 2014 Public Markets Committee Meeting , Equities Group and project consultant Mercer both
  - Updated the Committee on diligence conducted since the 31st January 2014 Public Markets Committee Meeting for the proposed re-set of the Non-U.S. EAFE active equities asset sub-class, *and*;
  - Recommended and obtained approval to release three of the sub-class' managers, reallocate the proceeds of those mandates to three new managers and implement a plan of transition for these changes which employs transition manager.

These changes will be presented in more detail in the Non-U.S. Equities Asset Class portion of this review.

Domestic Equities Asset Class Review

Market Performance Commentary:

- Major U.S. equity indexes continue to advance, posting new all-time highs
  - The Federal Reserve began the process of unwinding their 'QE' program beginning in December 2013; with expectations of a late 2014 completion date. Rates will remain low in the immediate future
  - Q4 13 earnings season was better than expected ,but Q1 14 estimates have been revised lower
  - Weaker than expected economic data was mostly dismissed as weather related as investors look to the future for signs of the continuing economic recovery. Jobs, inflation and retail sails will remain in focus.
  - Utility stocks have been the best performing sector in S&P® 500 YTD as volatility has driven investors to low-beta
  - Momentum as a style has outperformed Value over the past several months ;however, March saw a sharp reversal in Momentum and a shift to Value stocks. Unclear if this a temporary reversal or if the market will be looking for new areas of leadership.
- Major Non-U.S. equity indexes also continue to rise
  - The year was greeted by weak global economic data, EM 'crisis' concerns and geopolitical risks with Russia and the Ukraine
  - While the FED begins to unwind, Investors continue to look to the ECB, BOE and BOJ for clues about future stances on accommodative monetary policy.
    - European Equities have seen 35 +weeks of consecutive inflows;
    - While EM Equities had 18 weeks of consecutive outflows
  - Strong and weak currencies have offset each other giving similar index performance in local vs. US dollar terms
  - Equities have experienced sporadic bouts of volatility but VIX continues to re-set near historic lows
    - Domestic equities have managed to eke out slightly positive returns
    - European Equities have performed slightly better than Domestic with leadership from the periphery countries
    - Select EM Countries have performed well, but the index has posted negative returns YTD
  - Japanese Equities have been one of the worst Global performers YTD as the sentiment towards 'Abenomics' fades and the country reacts to fiscal adjustments in the form of higher taxes. Further BOJ easing could be a catalyst later in 2014
  - Select valuation opportunities remain, but earnings need to 'show-up' to justify further price gains

U.S. Equity Allocations as of 2/28/14

28-Feb-2014	Total Fund MV	33,073,929,474						
Portfolio	# Assets	Mkt Value	Pct Total Fund	Pct Public Equity	Pct Asser Class	Pct of SubClass	Inexed Pct of SubClass	Inexed Pct of Pb Eq
E2 MODEL	506	4,793,261,066.15	14.49%	26.43%	45.2032%	65.01%	65.01%	26.43%
E7 MODEL	127	806,934,108.13	2.44%	4.45%	7.6099%	10.94%	10.94%	4.45%
E8 MODEL	142	490,560,598.35	1.48%	2.70%	4.6263%	6.65%	6.65%	2.70%
INTECH LARGE CAP	136	525,558,790.36	1.59%	2.90%	4.9563%	7.13%		
LSV-US LARGE CAP VALUE	134	756,448,128.25	2.29%	4.17%	7.1337%	10.26%		
LargeCap Domestic Total	**1,045**	**7,372,762,691.24**	**22.29%**	**40.65%**	**69.5294%**	**100.00%**	**82.61%**	**33.58%**
		SAA Target	*23.00%*					
E3 MODEL	250	538,125,487.62	1.63%	2.97%	5.0748%	33.25%	33.25%	2.97%
E4 MODEL	295	543,897,785.74	1.64%	3.00%	5.1293%	33.60%	33.60%	3.00%
WELLINGTON MANAGEMENT CO	101	438,880,868.24	1.33%	2.42%	4.1389%	27.11%		
CRM MID CAP VALUE	54	97,756,006.03	0.30%	0.54%	0.9219%	6.04%		
MidCap DomesticTotal	**700**	**1,618,660,147.63**	**4.89%**	**8.93%**	**15.2649%**	**100.00%**	**66.85%**	**5.97%**
		SAA Target	*5.00%*					
E6	605	536,316,093.87	1.62%	2.96%	5.0578%	33.26%	33.26%	2.96%
CHAMPLAIN INVESTMENT PARTNERS	83	113,773,351.75	0.34%	0.63%	1.0729%	7.06%		
DIMENSIONAL FUND ADVISORS EQFD	438	443,947,978.30	1.34%	2.45%	4.1867%	27.53%		
TIMESSQUARE CAPITAL MANAGEMENT	96	518,342,983.65	1.57%	2.86%	4.8883%	32.15%		
Small Cap Domestic Total	**1,222**	**1,612,380,407.57**	**4.88%**	**8.89%**	**15.2057%**	**100.00%**	**33.26%**	**2.96%**
		SAA Target	*5.00%*					
US Equity Total	**2,967**	**10,603,803,246.44**	**32.06%**	**58.47%**	**100.0000%**	**58.47%**	**72.70%**	**42.51%**
		SAA Target	*33.00%*					

Non-U.S. Equity Allocations as of 2/28/14

28-Feb-2014	Total Fund MV	33,073,929,474							
Portfolio	# Assets	Mkt Value	Pct Total Fund	Pct Public Equity	Pct Asser Class	Pct of SubClass	Inexed Pct of SubClass	Inexed Pct of Pb Eq
BLACKROCK-EAFE CNTRY FUND UA	2	2,356,665,986.61	7.13%	12.99%	33.4557%	59.84%	59.84%	12.99%
BRANDES INVESTMENT PARTNERS INT EQ	66	528,010,011.15	1.60%	2.91%	7.4957%	13.41%		
ABERDEEN ASSET MANAGEMENT	50	485,334,178.26	1.47%	2.68%	6.8899%	12.32%		
HANSBERGER GLOBAL INVESTORS LC	69	338,054,928.03	1.02%	1.86%	4.7991%	8.58%		
WALTER SCOTT & PARTNERS	54	230,334,285.77	0.70%	1.27%	3.2699%	5.85%		
Large Cap Developed	**241**	**3,938,399,389.82**	**11.91%**	**21.72%**	**55.9104%**	**100.00%**	**59.84%**	**12.99%**
		SAA Target	*14.00%*					
BLACKROCK-MSCI EAFE SM CAP B	1	469,510,034.83	1.42%	2.59%	6.6653%	36.45%	36.45%	2.59%
AQR CAPITAL	566	180,229,879.67	0.54%	0.99%	2.5586%	13.99%		
FRANKLIN TEMPLETON INVESTMENTS	41	414,072,215.49	1.25%	2.28%	5.8783%	32.15%		
DIMENSIONAL FUND ADVISORS INTL SC	1,584	224,240,152.29	0.68%	1.24%	3.1834%	17.41%		
Small Cap Developed	**2,192**	**1,288,052,282.28**	**3.89%**	**7.10%**	**18.2855%**	**100.00%**	**36.45%**	**2.59%**
		SAA Target	*3.00%*					
BLACKROCK EMERGING MARKETS FUND	2	635,977,729.53	1.92%	3.51%	9.0285%	34.99%	34.99%	3.51%
EV SEM CIT ASRS	1,401	471,885,355.00	1.43%	2.60%	6.6990%	25.96%		
WILLIAM BLAIR EM EQUITY	119	432,879,111.00	1.31%	2.39%	6.1452%	23.81%		
LSV EM EQUITY	340	276,937,104.00	0.84%	1.53%	3.9315%	15.24%		
EM	**1,862**	**1,817,679,299.53**	**5.50%**	**10.02%**	**25.8042%**	**100.00%**	**34.99%**	**3.51%**
		SAA Target	6.00%					
Non US Equity Total	**4,295**	**7,044,130,971.63**	**21.30%**	**38.84%**	**100.0000%**	**38.84%**	**49.15%**	**19.09%**
		SAA Target	*23.00%*					

Risk Premium Factors Allocations as of 2/28/14

28-Feb-2014	Total Fund MV	33,073,929,474						
Portfolio	**# Assets**	**Mkt Value**	**Pct Total Fund**	**Pct Public Equity**	**Pct Asser Class**	**Pct of SubClass**	**Inexed Pct of SubClass**	**Inexed Pct of Pb Eq**
ISHARES MSCI USA MOMENTUM FACTOR ETF	1	125,160,000.00	0.38%	0.69%		25.66%		
ISHARES MSCI USA VALUE FACTOR ETF	1	119,400,000.00	0.36%	0.66%		24.48%		
ISHARES MSCI USA SIZE FACTOR ETF	1	117,400,000.00	0.35%	0.65%		24.07%		
ISHARES MSCI USA QUALITY FACTOR ETF	1	121,926,500.00	0.37%	0.67%		24.99%		
GOVERNMENT STIF 10	1	3,945,177.25	0.01%	0.02%		0.81%		
Risk Premia Overlay Total	**5**	**487,831,677.25**	**1.47%**	**2.69%**		**100.00%**		
Cash From Rebalance	1	1.00	0.00%	0.00%				
Public Equity Total	**7,268**	**18,135,765,896.32**	**54.83%**	**100.00%**				**61.60%**
		SAA Target	*56.00%*					

IMD House Views

U.S. Equity - Primary Market Metrics & Indicators:

- **Fundamentals**: **POSITIVE**
  - Major risks have receded and economic data suggests stable, sub-trend growth into 2014.
  - Persistently high U.S. unemployment raise questions about a sustainable recovery; no tailspin issues have surfaced.
  - At risk longer term due to stimulus measures; inflation remains generally subdued.
  - There is considerable liquidity; Federal Reserve policy remains accommodative.
  - Overall U.S. corporate profits are still growing, but with decelerating momentum as revenue trends are flat and pressures on profit margin expansion are surfacing.
- **Valuations**: **NEUTRAL**
  - P/E ratios (forward) are acceptable, though now less generous, and marginally less so for the mid- and smaller-sized companies: S&P 500, 14.3-15.9x, S&P MID, 16.6-19.4x; S&P SC600, 17.1-20.7x.
  - Historic P/Es still imply advances of 5-10% for mid and small caps; 9-12% for S&P 500.
  - Still rising earnings and low yields on 10-Yr Treasury notes combine for equity risk premiums that are above the 4.0% long-range average for large caps, but market advances have trimmed those of mid- and small-caps to near 3.0%
- **Sentiment**: **POSITIVE**
  - Lessened near-term equity market volatility (i.e., VIX Index) reflects growing acceptance of risk-oriented assets.
  - Asset flows that had gone to bonds and non-U.S. equities until 2013 continue shifting toward equities, though not necessarily to stock mutual funds

Performance as of 2/28/2014

	Net Returns (%)							Excess Returns (basis points)						
	3 Mths	YTD	1 Year	3 Years	5 Years	10 Years	Inception	3 Mths	YTD	1 Year	3 Years	5 Years	10 Years	Inception
LARGE CAP EQUITY														
ASRS E2: PHX (Passive)	3.50	0.95	25.21	14.32	22.95	7.21	7.48	-1	-1	-16	-3	-5	5	8
S&P 500	3.51	0.96	25.37	14.35	23.00	7.16	---							
INTECH: FL (Active)	5.76	2.38	31.11	15.44	21.94	8.01	10.05	86	24	241	-35	-118	35	78
S&P 500 Growth	4.90	2.14	28.70	15.79	23.13	7.66	---							
LSV: CHI (Active)	2.52	-0.13	30.91	15.98	27.14	9.14	11.48	50	18	903	306	414	255	256
S&P 500 Value	2.02	-0.31	21.88	12.91	22.99	6.59	---							
ASRS E7: PHX (Passive)	1.19	-0.34	19.38	---	---	---	17.86	3	1	29	---	---	---	20
MSCI USA High Div Yld Index	1.16	-0.35	19.09	---	---	---	---							
ASRS E8: PHX (Passive)	2.50	1.21	18.08	---	---	---	16.91	0	-2	54	---	---	---	79
MSCI USA Min Vol Index	2.51	1.23	17.54	---	---	---	---							
Total Large-Cap														
MID CAP EQUITY														
Wellington: SF (Active)	8.99	5.46	35.95	15.03	24.18	11.94	12.04	317	280	938	89	-277	179	128
S&P 400	5.83	2.66	26.58	14.14	26.95	10.15	---							
ASRS E3: PHX (Passive)	6.16	2.68	27.11	14.44	27.77	11.09	8.95	17	7	24	35	27	55	60
S&P 400 Growth	5.99	2.61	26.87	14.09	27.50	10.53	---							
CRM: NY (Active)	6.23	1.30	26.58	11.90	20.90	9.80	10.24	56	-141	33	-235	-552	9	14
ASRS E4: PHX (Passive)	5.61	2.73	26.28	14.18	26.25	9.97	10.83	-6	2	3	-7	-16	27	23
S&P 400 Value	5.67	2.71	26.25	14.25	26.41	9.71	---							
Total Mid-Cap														
SMALL CAP EQUITY														
ASRS E6: PHX (Passive)	1.94	0.41	32.22	16.64	27.84	---	8.89	6	-2	-8	-19	-21	---	40
Champlain: VT (Active)	-1.35	-2.57	23.26	13.63	23.54	---	10.21	-324	-299	-904	-320	-451	---	-2
S&P 600	1.88	0.43	32.30	16.83	28.04	10.18	---							
TimesSquare: New York (Active)	4.33	0.44	30.16	18.41	28.36	---	13.41	-167	-279	-487	253	-33	---	275
Russell 2500 Growth	6.00	3.23	35.03	15.87	28.68	9.91	---							
DFA: Santa Monica (Active)	2.69	0.20	32.09	14.93	31.18	10.16	12.76	25	-64	46	-154	373	49	119
R2k Val/ S&P 600 Value	2.45	0.85	31.63	16.47	27.45	9.67	---							
Total Small-Cap														

U.S. Equity – Passive Strategies

Portfolio	($MM)	% Total Equity	% US Equity	Benchmark
E2	4,806.6	26.4%	45.2%	S&P 500
E3	547.0	3.0%	5.1%	S&P 400 Growth
E4	544.9	3.0%	5.1%	S&P 400 Value
E6	537.1	3.0%	5.0%	S&P 600
E7	810.3	4.5%	7.6%	MSCI USA High Dividend Yield Index
E8	491.9	2.7%	4.6%	MSCI USA Minimum Volatility Index
Total	7,737.8	42.6%	72.7%	

U.S. Equity – Active Strategies

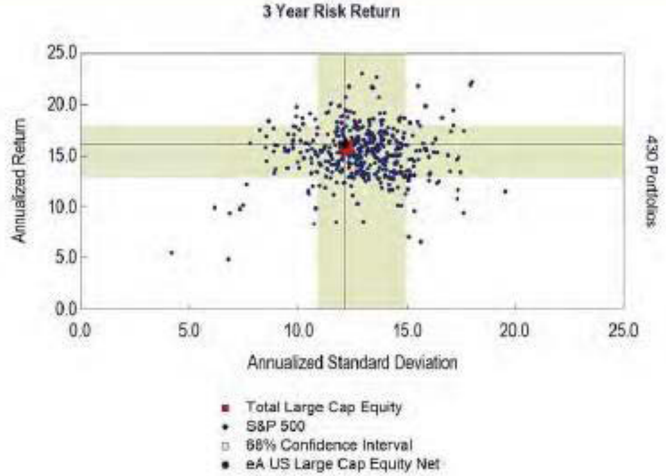
U.S Equity Large Cap							
LSV	LSV's strategy is managed using quantitative techniques to select individual securities in a risk-controlled, bottom-up approach. The portfolio decision making process is quantitative, ranking securities based on fundamental measures of value and indicators of near-term appreciation potential. The objective of the model is to pick undervalued stocks with signs of recent recovery. Stocks are screened simultaneously to generate an overall expected return ranking for each stock in the universe; based on traditional value measures, assessing whether a security is undervalued, and momentum indicating signs of recent recovery.						
	($MM)	% Total Equity	% US Equity	Benchmark	Net Excess Return (bps)		
					1 year	3 year	5 year
	759.5	4.2%	7.1%	S&P 500 Value	903	306	414
INTECH	INTECH believes it can add value using natural stock price volatility through a mathematically based, risk-managed process. The firm does not pick individual stocks or forecast stock alphas, but uses natural stock price volatility and correlation characteristics to attempt to generate an excess return. Essentially, INTECH adjusts the cap weights of an index portfolio to potentially more efficient combinations. INTECH's relative performance is generally influenced by two factors - the market's relative volatility structure and size (market diversity). Relative volatility refers to how stocks move relative to one another or relative to a benchmark. Size (market diversity) is a measure of how capital is distributed among stocks in a market or index. Since INTECH's strategies tend to overweight smaller stocks and underweight larger stocks in a large-cap index, rising diversity tends to benefit INTECH's relative performance.						
	($MM)	% Total Equity	% US Equity	Benchmark	Net Excess Return (bps)		
					1 year	3 year	5 year
	526.4	2.9%	4.9%	S&P 500 Growth	241	-35	-118

Arizona State Retirement System

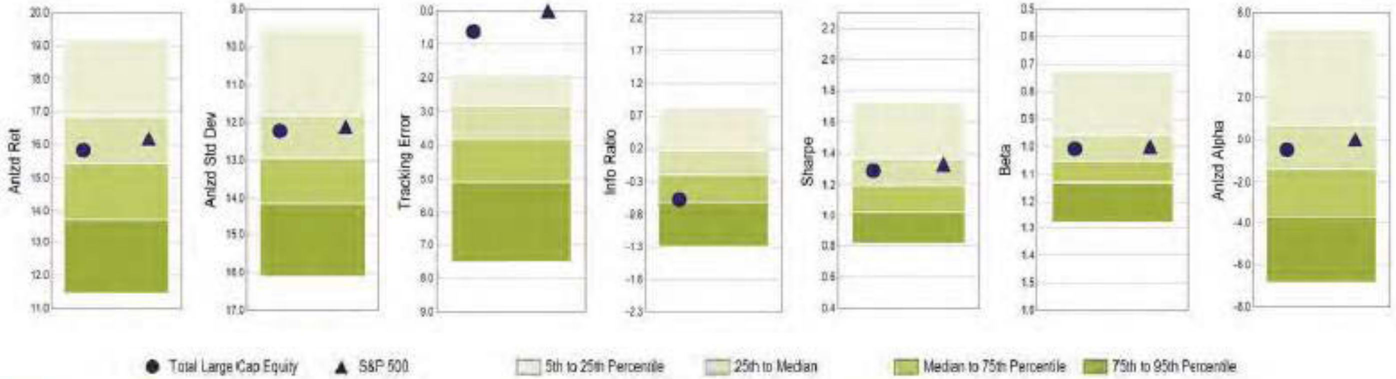
Asset Class Analysis - Total Large Cap Equity

Arizona State Retirement System

Asset Class Analysis - Total Large Cap Equity

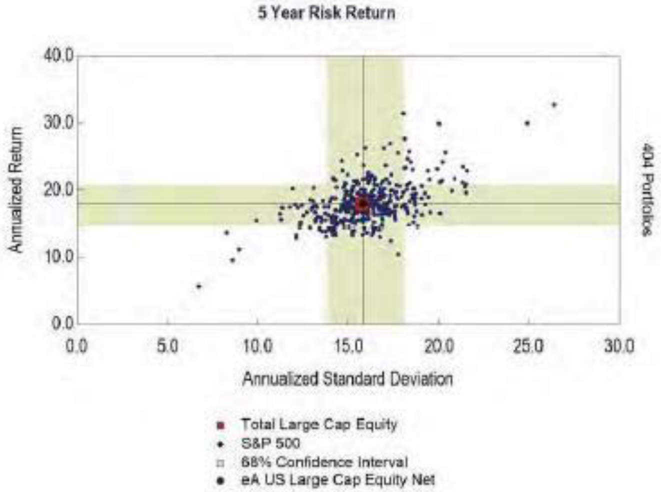


*Style map is returns based.



Arizona State Retirement System

Asset Class Analysis - Total Large Cap Equity



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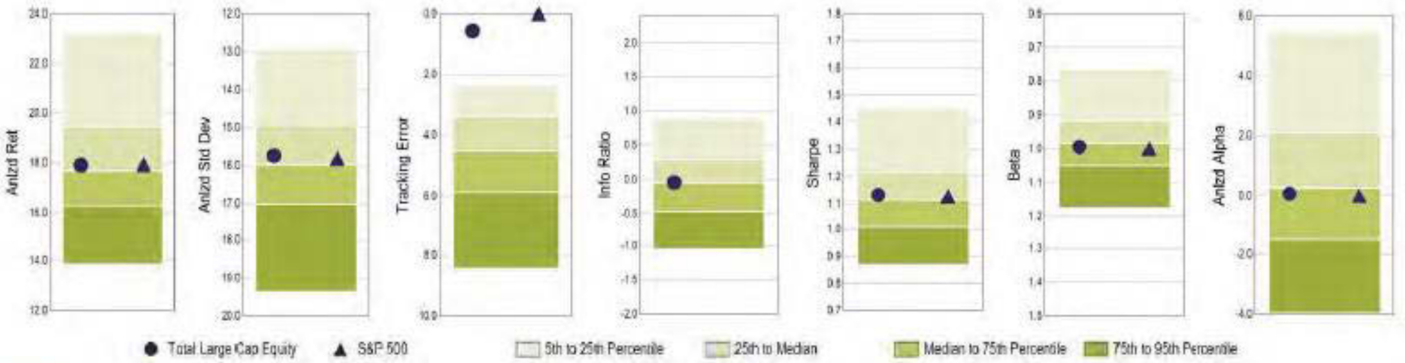


U.S. Equity – Active Strategies

U.S Equity Mid Cap

Wellington

The Mid Cap Opportunities Portfolio seeks to outperform the S&P MidCap 400 Index by investing in high-quality, established mid-cap companies with good balance sheets, strong management teams, and market leadership in their industry.

($MM)	% Total Equity	% US Equity	Benchmark	Net Excess Return (bps)		
				1 year	3 year	5 year
439.5	2.4%	4.1%	S&P 400	938	89	-277

CRM

CRM's investment philosophy strives to outperform the broad market and pertinent indices over a full market cycle by participating in good market periods and limiting declines in poor periods. The Firm's experience in identifying what it believes to be inappropriately undervalued companies and its process of patiently waiting for market recognition has provided CRM's clients with long-term returns. The Firm looks for the following attributes in all investment ideas within the portfolio:

1. **Change**: The global financial markets are rich with change. Every day the markets present investors with mergers, divestitures, restructurings, new management teams or new products and expanded markets.
2. **Neglect**: Especially in its early stages, change tends to be greeted with uncertainty, expressed as investor neglect — manifested through behavioral finance, negative sentiment, negative-to-neutral stock ratings, benchmark exclusion, and buyer aversion.
3. **Valuation**: When change meets neglect, the intrinsic value of a company may exceed the current stock price. At the intersection of change and neglect with attractive valuation, CRM finds the potential for outperformance with lower downside risk.

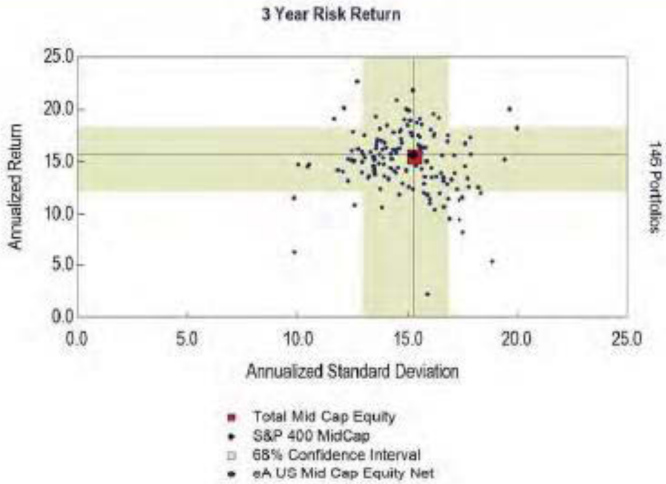
($MM)	% Total Equity	% US Equity	Benchmark	Net Excess Return (bps)		
				1 year	3 year	5 year
98.1	0.5%	0.9%	S&P 400 Value	33	-235	-552

Arizona State Retirement System

Asset Class Analysis - Total Mid Cap Equity

Arizona State Retirement System

Asset Class Analysis - Total Mid Cap Equity



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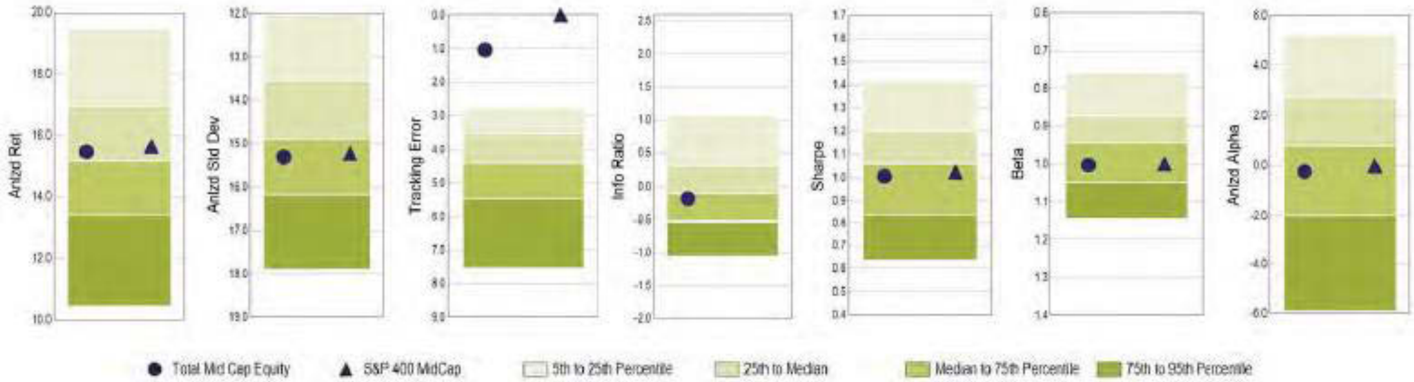
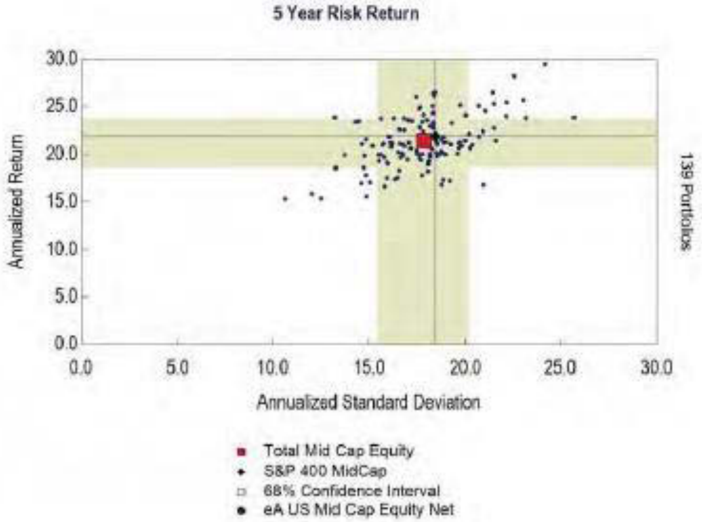
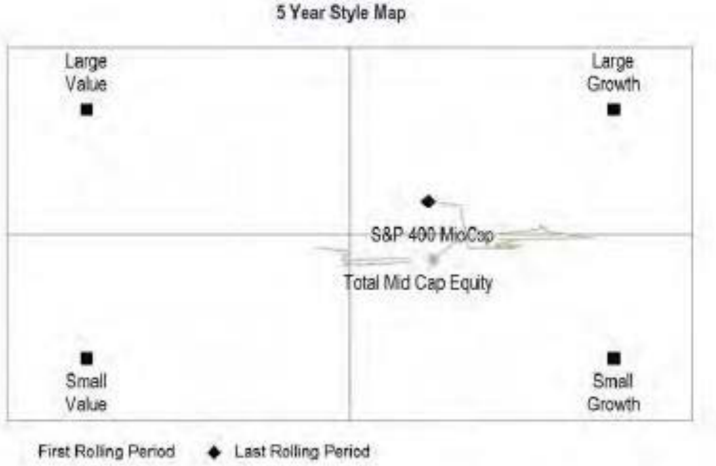


Arizona State Retirement System

Asset Class Analysis - Total Mid Cap Equity





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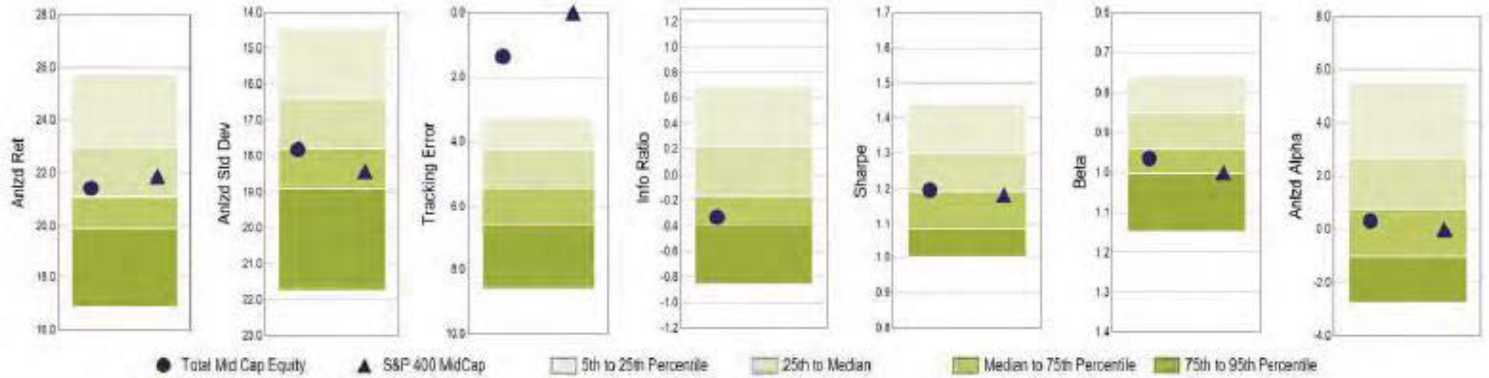


U.S. Equity – Active Strategies

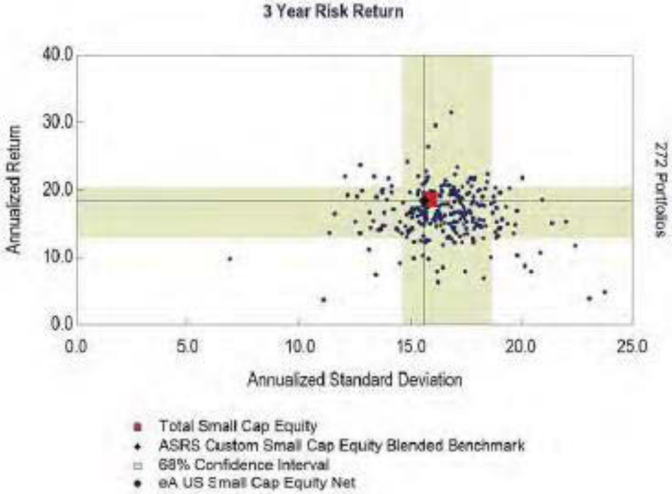
<table>
<tr><th colspan="8">U.S Equity Small Cap</th></tr>
<tr><td rowspan="4">TimesSquare</td><td colspan="7">TSCM uses fundamental research skills, which place a particular emphasis on the assessment of management quality and an in-depth understanding of superior business models, to build a diversified portfolio of growth stocks which will generate superior risk-adjusted returns. TSCM believes the market is still inefficient, so that their proprietary independent research will add value for clients.</td></tr>
<tr><td rowspan="2">($MM)</td><td rowspan="2">% Total Equity</td><td rowspan="2">% US Equity</td><td rowspan="2">Benchmark</td><td colspan="3">Net Excess Return (bps)</td></tr>
<tr><td>1 year</td><td>3 year</td><td>5 year</td></tr>
<tr><td>520.8</td><td>2.9%</td><td>4.9%</td><td>Russell 2500 Growth</td><td>-487</td><td>253</td><td>-33</td></tr>
<tr><td rowspan="4">DFA</td><td colspan="7">DFA attempts to capture excess returns by providing reliable exposure to style and size risk factors. DFA's research has shown that the value style, as defined by book-to-market ratio, and small market capitalization are risk factors that explain a large proportion of performance over long periods of time. DFA structures the portfolio to target these risk factors which should deliver higher expected returns than the market over the long term.</td></tr>
<tr><td rowspan="2">($MM)</td><td rowspan="2">% Total Equity</td><td rowspan="2">% US Equity</td><td rowspan="2">Benchmark</td><td colspan="3">Net Excess Return (bps)</td></tr>
<tr><td>1 year</td><td>3 year</td><td>5 year</td></tr>
<tr><td>444.4</td><td>2.4%</td><td>4.2%</td><td>S&P 600 Value</td><td>46</td><td>-154</td><td>373</td></tr>
<tr><td rowspan="4">Champlain</td><td colspan="7">Champlain invests in quality business at a good price. The portfolio holds shares of superior businesses with credible managements at a discount to intrinsic value, giving several potential paths to wealth creation. First, the market may bid the shares to a premium over fair value. Second, management may grow the fair value over time in a faster rate than market appreciation. Third, the company may be bought by a larger company or private market investor.</td></tr>
<tr><td rowspan="2">($MM)</td><td rowspan="2">% Total Equity</td><td rowspan="2">% US Equity</td><td rowspan="2">Benchmark</td><td colspan="3">Net Excess Return (bps)</td></tr>
<tr><td>1 year</td><td>3 year</td><td>5 year</td></tr>
<tr><td>113.9</td><td>0.6%</td><td>1.1%</td><td>S&P 600</td><td>-904</td><td>-320</td><td>-451</td></tr>
</table>

Arizona State Retirement System

Asset Class Analysis - Total Small Cap Equity

Arizona State Retirement System

Asset Class Analysis - Total Small Cap Equity



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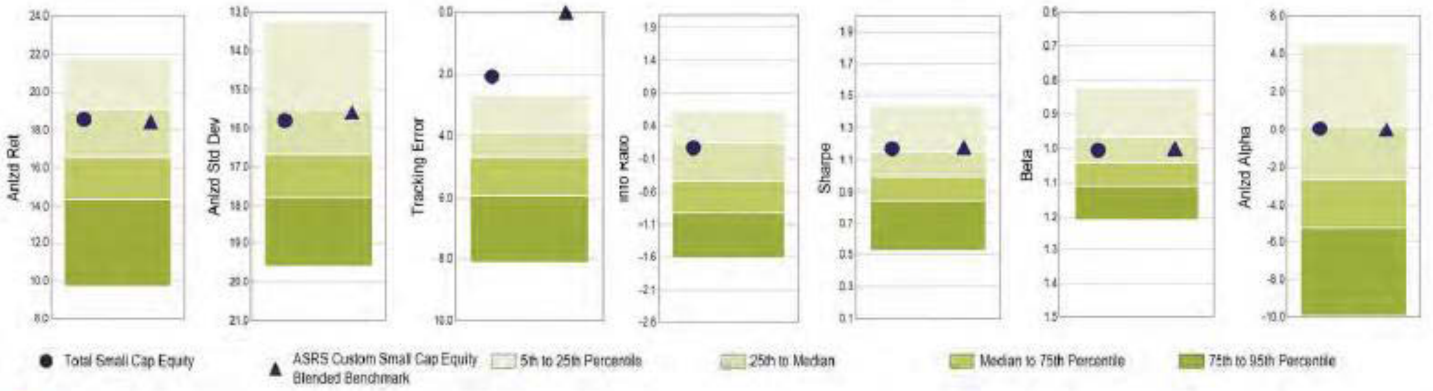
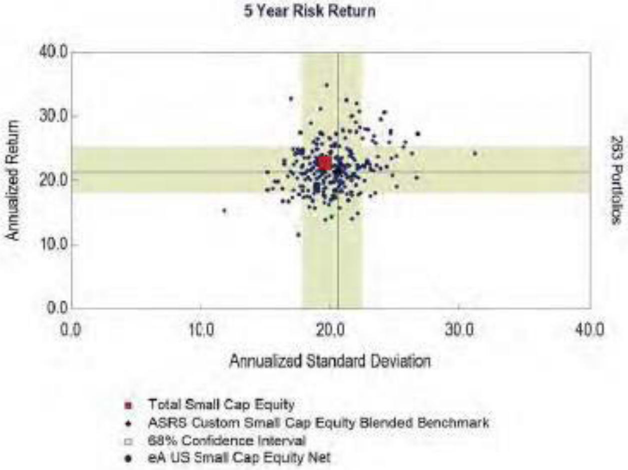


Arizona State Retirement System

Asset Class Analysis - Total Small Cap Equity



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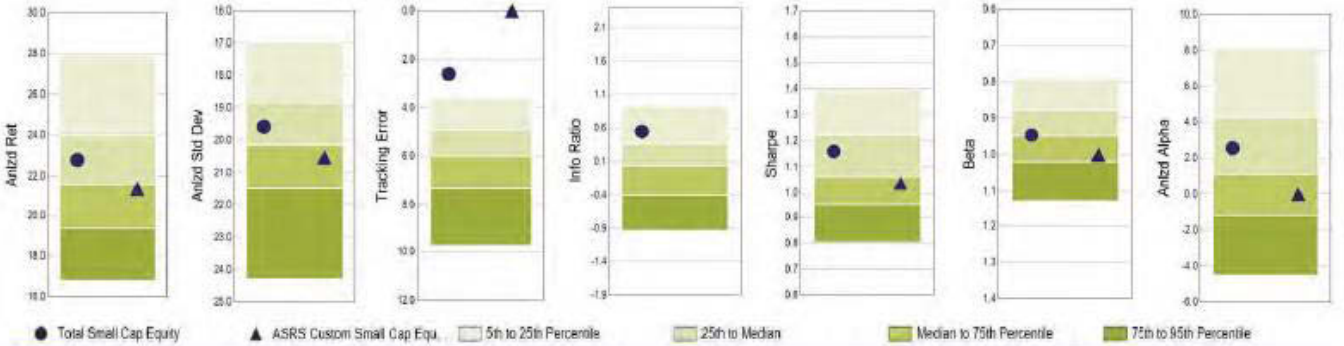


NEPC, LLC

December 31, 2013

Non-U.S. Equities Asset Class Review

Non-U.S Equities Class Program Update – Summary of 3-27-2014 Asset Class Committee Meeting

IMD Equity Group ("staff") undertook during 4Q2013 and 1Q2014 a holistic review of the external, active strategies managers within the International Large-Cap Equity asset sub-class (EAFE). Prompting the review was staff's conclusion that the current complement of active managers is sub-optimal. Staff identified in particular, three managers who demonstrated unusual and unacceptable tracking error, and poor relative performance, over the short and intermediate term, to the extent that all three exhausted the value each mandate added to the performance of their respective benchmarks. This was sufficiently acute to undermine performance contributed from the indexed portion of the sub-class and offset positive relative performance of the two other non-U.S. equities asset sub-classes to the extent that the overall non-U.S. equities class underperformed the blended benchmark.

Staff recognizes that active managers will not generate superior performance during all periods; however, the review served to identify certain weakness and potential opportunities to improve the overall EAFE construct. At the end of 3Q2013, staff assembled a short list of potentially viable replacement manager candidates sourced from prior meetings and extracted from the eVestment database. It then engaged Mercer as project consultant to conduct the due diligence and analysis on these candidates, as well as two additional suggested by Mercer, all of which Staff discussed in the 31st January 2014 Public Markets Asset Class Committee. Staff outlined for the committee its four preferences and advised that it would pursue late stage interviews with them as preparation for this committee meeting and, potentially, contract(s). It expects to award three mandates sourced from the existing EAFE managers referenced above.

<u>Non-U.S Equities Class Program Update – Summary of 3-27-2014 Asset Class Committee Meeting</u>

Non-U.S. Equities Large-Cap EAFE Manager Review

EAFE: Three Sub-Class active mandates have hindered its, and Non-U.S. Equities performance over the past year

- Hansberger (EAFE Growth): Until recently, has underperformed
  - Long-range confidence in the portfolio management team has eroded
- Walter Scott (EAFE Growth): Continuing to underperform after a strong prior early period
  - Strategy is time-dependent
- Aberdeen (EAFE Value): Continuing to underperform after a strong prior early period
  - Strategy is time-dependent

Staff engaged a project consultant to supplement its analysis and vetting of potential replacements. Conclusions and recommendations of the EAFE Large Cap Review were disseminated at the Asset Class Committee meeting on March 27th, 2014.

IMD House Views

Non-U.S. Equities - Primary Market Metrics & Indicators:

- **Fundamentals**: **POSITIVE**
  - GDP growth in the Eurozone has begun to look less recessional while that of the lesser-developed economies remains off its pace, but comparatively stronger.
  - Relatively inexpensive and available money supports a shift toward risk assets.
  - Monetary and economic policies focused on controlling economic growth and fiscal stability.
- **Valuations**: **POSITIVE**
  - Reasonable global valuations relative to U.S.; price-to-book values of 1.5x - 1.9x; P/Es of 13.5x – 15.2x on trend earnings.
  - Dividend yields are incrementally more favorable with most ranging from 1.5x to 1.6x that of the S&P500.
- **Sentiment**: **POSITIVE**
  - Money flows continue toward both U.S. and non-U.S. equities; excepting the emerging markets, investors are less guarded and remain constructive on global risks.
  - Major non-U.S. markets performances are keeping pace with those of the U.S.

Performance as of 2/28/2014

	3 Mths	YTD	1 Year	3 Years	5 Years	10 Years	Inception	3 Mths	YTD	1 Year	3 Years	5 Years	10 Years	Inception
INTERNATIONAL EQUITY														
Aberdeen: Edinburgh (LC Active)	1.14	1.02	8.49	6.13	---	---	6.13	-170	-29	-1,124	-98	---	---	-98
Brandes: SD (LC Active)	2.15	1.72	27.21	6.43	15.97	6.89	9.80	-69	41	748	-68	-360	-127	295
Blackrock EAFE: SF(Passive)	2.85	1.33	19.52	6.93	---	---	12.15	1	2	-21	-18	---	---	-15
Hansberger: FL (LC Active)	-0.14	-1.90	14.55	3.67	18.47	---	5.99	-298	-320	-518	-344	-110	---	-148
Walter Scott: Edinburgh (LC Active)	-1.68	-2.37	6.88	---	---	---	5.64	-452	-368	-1,286	---	---	---	-250
MSCI EAFE	2.84	1.31	19.74	7.11	18.13	7.14	---							
Total Int'l LC Equity														
AQR Capital	6.33	3.83	---	---	---	---	23.88	-2	-7	---	---	---	---	128
Blackrock EAFE SC: SF (Passive)	6.26	3.83	26.30	9.52	---	---	16.55	-9	-7	-33	-39	---	---	-28
DFA: Santa Monica (SC Active)	8.31	5.41	29.87	8.65	20.06	---	7.26	196	151	324	-126	-371	---	12
Franklin Templeton: San Mateo (SC Active)	2.84	1.06	26.92	---	---	---	13.92	-351	-285	29	---	---	---	369
MSCI EAFE Small Cap	6.35	3.90	26.63	9.91	23.77	9.42	---							
Total Int'l SC Equity														
Blackrock EM: SF (Passive)	-4.82	-3.57	-6.24	-2.24	---	---	-0.99	-3	-17	-52	-56	---	---	-52
William Blair: Chicago (EM Active)	-1.20	-0.85	-0.48	3.43	---	---	1.54	358	255	523	511	---	---	288
LSV: Chicago (EM Active)	-5.38	-4.56	-7.33	-1.53	---	---	-0.02	-60	-117	-162	15	---	---	54
Eaton Vance: Boston (EM Active)	-1.99	-1.97	-1.40	0.02	---	---	0.72	280	143	432	170	---	---	127
MSCI Emerging Markets	-4.78	-3.40	-5.71	-1.68	---	---	---							
Total EM Equity														
Total International														

Non-U.S. Equity – Passive Strategies

Portfolio	AUM ($MM)	% Total Equity	% non-US Equity	Benchmark
BlackRock EAFE	2,356.7	13.0%	33.4%	MSCI EAFE Gross
BlackRock EAFE Small Cap	469.5	2.6%	6.7%	MSCI EAFE Small Cap Gross
BlackRock Emerging Markets	636.0	3.5%	9.0%	MSCI Emerging Markets Gross
Total	3,462.2	19.0%	49.1%	

Non-U.S. Equity – Active Strategies

<table>
<tr><th colspan="9">Non- U.S Developed Large Cap Equity</th></tr>
<tr><td rowspan="4">Brandes</td><td colspan="8">Brandes is a bottom-up, Graham & Dodd, value-oriented, investment manager focusing on the fundamental characteristics of a company in order to develop an estimate of its intrinsic value. Brandes selects stocks that are selling at a discount to the firm’s estimates of their intrinsic business value, seeking to establish a margin of safety and an opportunity for competitive performance. The investment process drives the firm to build portfolios that typically consist of out-of-favor or overlooked issues that it believes are undervalued. Such securities may remain overvalued for months or years, and may exhibit sharp price fluctuations.</td></tr>
<tr><td rowspan="2">($MM)</td><td rowspan="2">% Total Equity</td><td rowspan="2">% non-US Equity</td><td rowspan="2">Benchmark</td><td colspan="3">Excess Return (bps)</td></tr>
<tr><td>1 year</td><td>3 year</td><td>5 year</td></tr>
<tr><td>525.3</td><td>2.9%</td><td>7.4%</td><td>MSCI EAFE</td><td>748</td><td>-68</td><td>-360</td></tr>
<tr><td rowspan="4">Aberdeen</td><td colspan="8">Aberdeen believes that competitive long-term returns are achieved by identifying high quality stocks at attractive valuations and holding them for the long term. It is the firm’s belief that sound fundamentals drive stock prices over time. Aberdeen employs a fundamental bottom-up investment approach based upon a rigorous and disciplined proprietary research effort which originates with direct company due diligence visits. Investment professionals hold absolute return to be of the utmost importance over the long term and are benchmark-aware, but not benchmark-driven. As such, indices do not serve as a starting point for portfolio construction, and Aberdeen is comfortable taking decisive positions away from the benchmark.</td></tr>
<tr><td rowspan="2">($MM)</td><td rowspan="2">% Total Equity</td><td rowspan="2">% non-US Equity</td><td rowspan="2">Benchmark</td><td colspan="3">Excess Return (bps)</td></tr>
<tr><td>1 year</td><td>3 year</td><td>5 year</td></tr>
<tr><td>488.5</td><td>2.7%</td><td>6.9%</td><td>MSCI EAFE</td><td>-1,124</td><td>-98</td><td>n/a</td></tr>
</table>

Non-U.S. Equity – Active Strategies

Non- U.S Developed Large Cap Equity

Hansberger

Hansberger Global Investors growth equity philosophy is founded on the premise that superior growth companies with attractive valuations provide the best opportunities for investment. Hansberger believes that investors should seek to identify those companies, internationally, that have consistently exhibited the ability to maintain a competitive market advantage through innovative product design, exceptional management, strong market share and superior profitability. Hansberger identifies companies with superior growth characteristics with a focus on historical long-term company fundamentals and sustainable competitive advantage; industry Leaders with higher secular growth, superior profitability, and lower balance sheet risk

($MM)	% Total Equity	% non-US Equity	Benchmark	Excess Return (bps)		
				1 year	3 year	5 year
339.1	1.9%	4.8%	MSCI EAFE	-518	-344	-110

Walter Scott

Walter Scott believes the objective for all long term investors is to maintain and enhance the, after inflation, purchasing power of their assets. Walter Scott targets long term compound real returns of 7-10% per annum for the portfolio. The firm believes this will most likely be achieved by investing in companies with high rates of internal wealth generation which in time will translate into return to the investor. Thus the firm's research efforts are directed towards identifying companies that meet its investment criteria using bottom-up, fundamental research to build a portfolio of 40-50 positions with relatively low turnover.

($MM)	% Total Equity	% non-US Equity	Benchmark	Excess Return (bps)		
				1 year	3 year	5 year
231.4	1.3%	3.3%	MSCI EAFE	-1,286	n/a	n/a

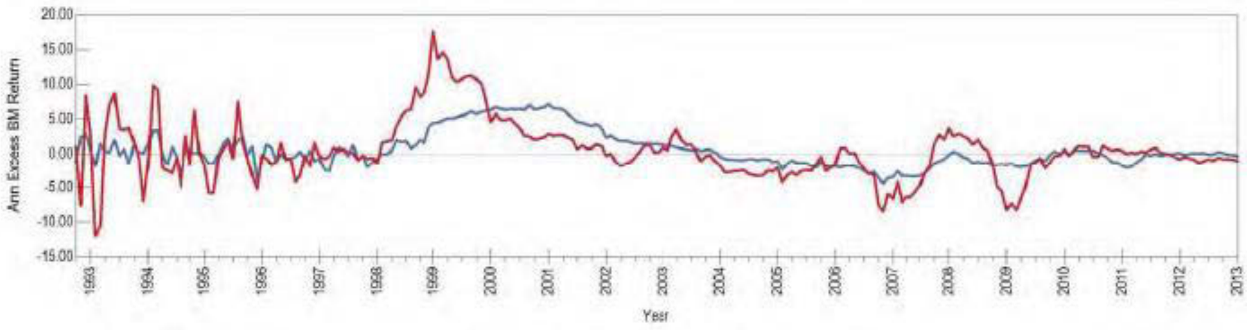
Non-U.S. Equity – Active Strategies

<table>
<tr><th colspan="8">Non- U.S Developed Small Cap Equity</th></tr>
<tr><td rowspan="4">DFA</td><td colspan="7">DFA attempts to capture excess returns by providing reliable exposure to style and size risk factors. DFA’s research has shown that the value style, as defined by book-to-market ratio, and small market capitalization are risk factors that explain a large proportion of performance over long periods of time. DFA structures the portfolio to target these risk factors which should deliver higher expected returns than the market over the long term.</td></tr>
<tr><td rowspan="2">($MM)</td><td rowspan="2">% Total Equity</td><td rowspan="2">% non - US Equity</td><td rowspan="2">Benchmark</td><td colspan="3">Excess Return (bps)</td></tr>
<tr><td>1 year</td><td>3 year</td><td>5 year</td></tr>
<tr><td>224.6</td><td>1.2%</td><td>3.2%</td><td>MSCI EAFE Small Cap</td><td>324</td><td>-126</td><td>-371</td></tr>
<tr><td rowspan="4">Franklin Templeton</td><td colspan="7">FTI’s investment philosophy is based on a belief that companies with sustainable competitive advantages, which are able to generate cash flows, strong return on investment and have low downside risk, can create shareholder value and deliver superior risk-adjusted returns over a full market cycle. By conducting disciplined, fundamental bottom-up research, Franklin Global Small Cap Team can identify companies whose potential has not been fully recognized by the market.</td></tr>
<tr><td rowspan="2">($MM)</td><td rowspan="2">% Total Equity</td><td rowspan="2">% non - US Equity</td><td rowspan="2">Benchmark</td><td colspan="3">Excess Return (bps)</td></tr>
<tr><td>1 year</td><td>3 year</td><td>5 year</td></tr>
<tr><td>420.0</td><td>2.3%</td><td>6.0%</td><td>MSCI EAFE Small Cap</td><td>29</td><td>n/a</td><td>n/a</td></tr>
<tr><td rowspan="4">AQR</td><td colspan="7">AQR's investment philosophy is based on the fundamental concepts of value and momentum. They believe that pursuing the philosophy of over weighting cheap securities which are showing a positive outlook while simultaneously under weighting expensive securities with a deteriorating outlook across many markets will continue to work over the long term. AQR's believes that applying this valuation and momentum philosophy across a large number of securities, minimizing transaction costs, and incorporating disciplined risk-control will lead to attractive long-term results.</td></tr>
<tr><td rowspan="2">($MM)</td><td rowspan="2">% Total Equity</td><td rowspan="2">% non - US Equity</td><td rowspan="2">Benchmark</td><td colspan="3">Excess Return (bps)</td></tr>
<tr><td>1 year</td><td>3 year</td><td>5 year</td></tr>
<tr><td>179.6</td><td>1.0%</td><td>2.5%</td><td>MSCI EAFE Small Cap</td><td>n/a</td><td>n/a</td><td>n/a</td></tr>
</table>

Arizona State Retirement System

Asset Class Analysis - Total International Developed Markets Equity

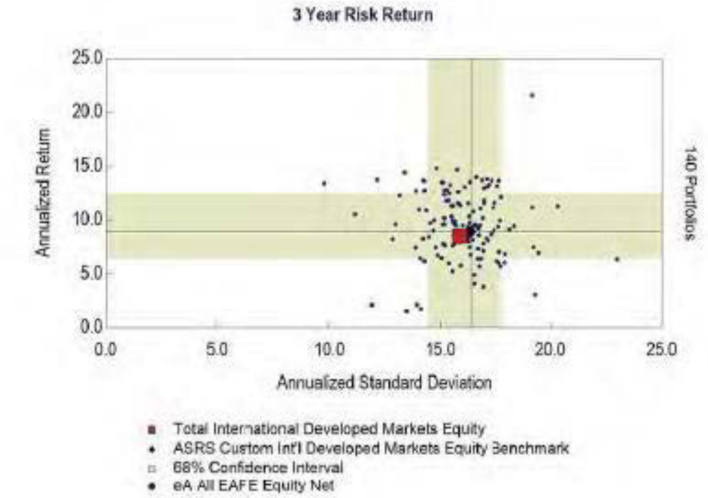
Rolling Annual Excess Benchmark Return



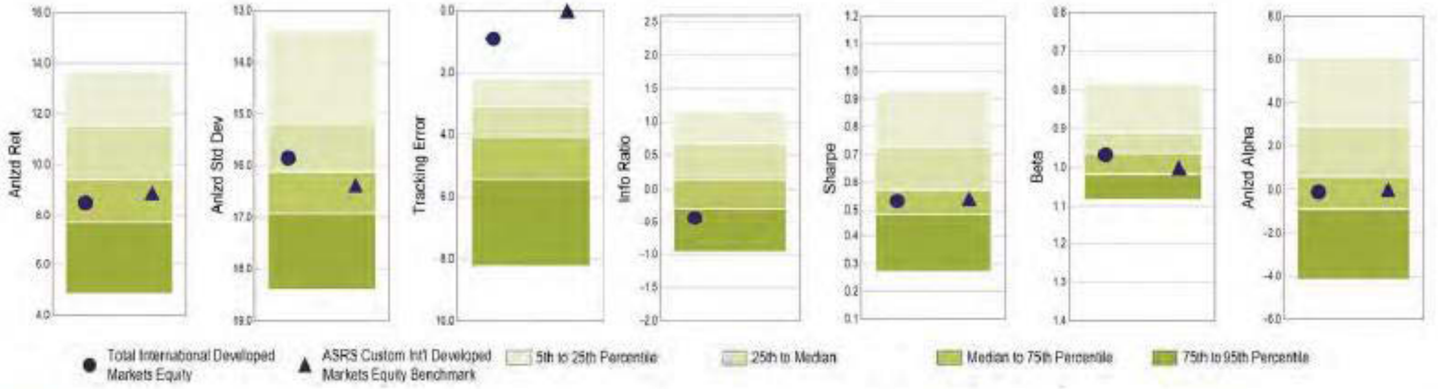
eA All EAFE Equity Net Accounts

Arizona State Retirement System

Asset Class Analysis - Total International Developed Markets Equity



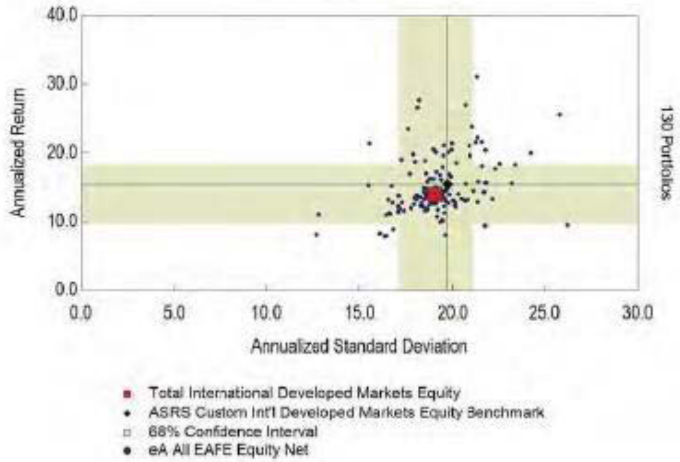
*Style map is returns based.



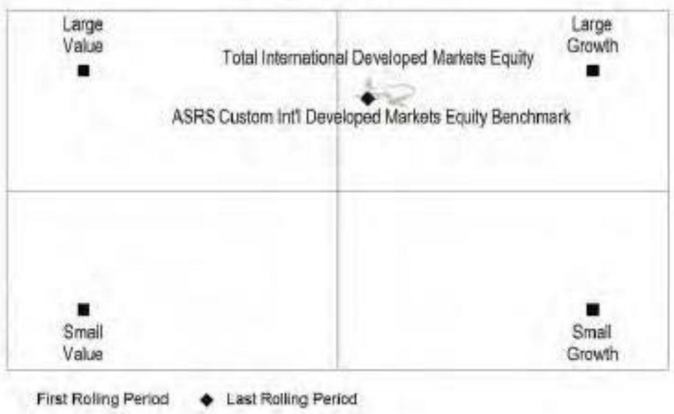
Arizona State Retirement System

Asset Class Analysis - Total International Developed Markets Equity

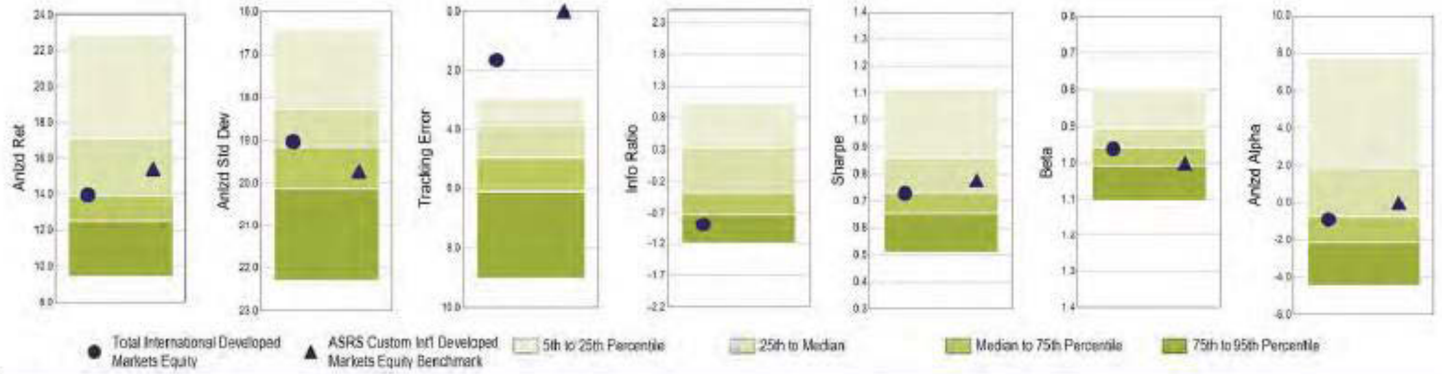
5 Year Risk Return



5 Year Style Map



*Style map is returns based.



International Developed Small Cap

- International Small Caps had a very good year in 2013 primarily due to the prospects of a recovery in the Euro-Zone and the positive effects of accommodative monetary policy in Japan.
- ***DFA*** has recently posted strong excess returns of 300bps over the past year. Their deep value quantitative investment process has been helped by a value bias in the non-US developed markets over the past quarter and their performance benchmark is a neutral MSCI EAFE Small Cap Index.
- ***Franklin Templeton (FT)*** had a stellar year, posting one year excess returns of 1,136bps for their bottoms-up fundamental stock selection portfolio. The mandate focuses on low leverage growth companies with strong cash flows, near term momentum and attractive valuations. The portfolio is highly concentrated and should be expected to deviate substantially from their benchmark over short periods of time. There have been no firm changes of note and the team added an analyst to the team as a generalist in 2012.
- ***AQR***, a recent hire in 2013, believes fundamentals drive stock returns. However, they tend to select stocks that combine value and momentum factor characteristics. Additionally, they use systematic rebalancing to add value when appropriate. AQR has performed in-line with the benchmark since hired.

Non-U.S. Equity – Active Strategies

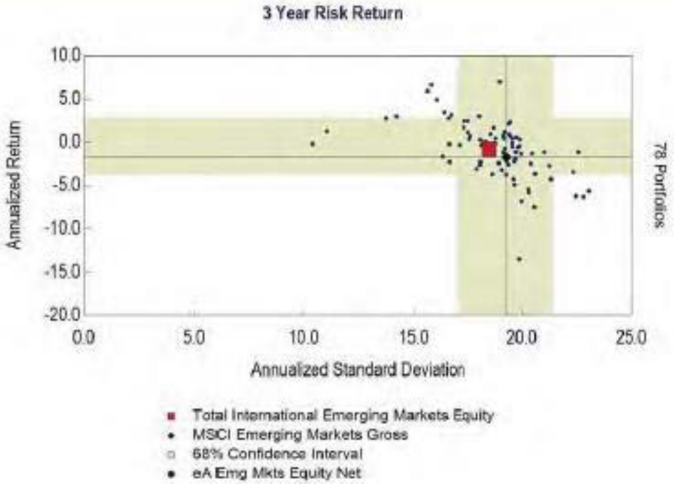
Non- U.S Emerging Market Equity							
Eaton Vance	The Eaton Vance - Parametric Emerging Markets Equity strategy utilizes a structured, rules-based investment approach that seeks to exploit the unique characteristics of the emerging market equity asset class to achieve enhanced returns based on their research indicating that the systematic movement of developing countries is the dominant factor in explaining security returns, supporting country selection, as opposed to security selection, as the most important aspect in capturing returns in emerging markets.						
	($MM)	% Total Equity	% non - US Equity	Benchmark	Excess Return (bps)		
					1 year	3 year	5 year
	473.7	2.6%	6.7%	MCSI Emerging Markets	432	170	n/a
LSV	The Emerging Markets Value Equity strategy's primary emphasis is the use of quantitative techniques to select individual securities in what would be considered a bottom-up approach. A risk control discipline limits the over- or under-exposure of the portfolio to industry concentrations. Value factors and security selection dominate sector/industry factors as drivers of performance.						
	($MM)	% Total Equity	% non - US Equity	Benchmark	Excess Return (bps)		
					1 year	3 year	5 year
	277.4	1.5%	3.9%	MCSI Emerging Markets	-162	15	n/a
William Blair	William Blair's philosophy is based on the belief that the market is inefficient with respect to distinguishing between an average growth company and a quality growth company. In their view, a quality growth company is one that can achieve a higher growth rate for a longer period of time than the market expects, leading to superior stock performance. Characteristics of the business franchises for these companies commonly include experienced and motivated management teams, unique business models, and attractive financial characteristics.						
	($MM)	% Total Equity	% non - US Equity	Benchmark	Excess Return (bps)		
					1 year	3 year	5 year
	433.7	2.4%	6.1%	MCSI Emerging Markets	523	511	n/a

Arizona State Retirement System

Asset Class Analysis - Total International Emerging Markets Equity

Arizona State Retirement System

Asset Class Analysis - Total International Emerging Markets Equity



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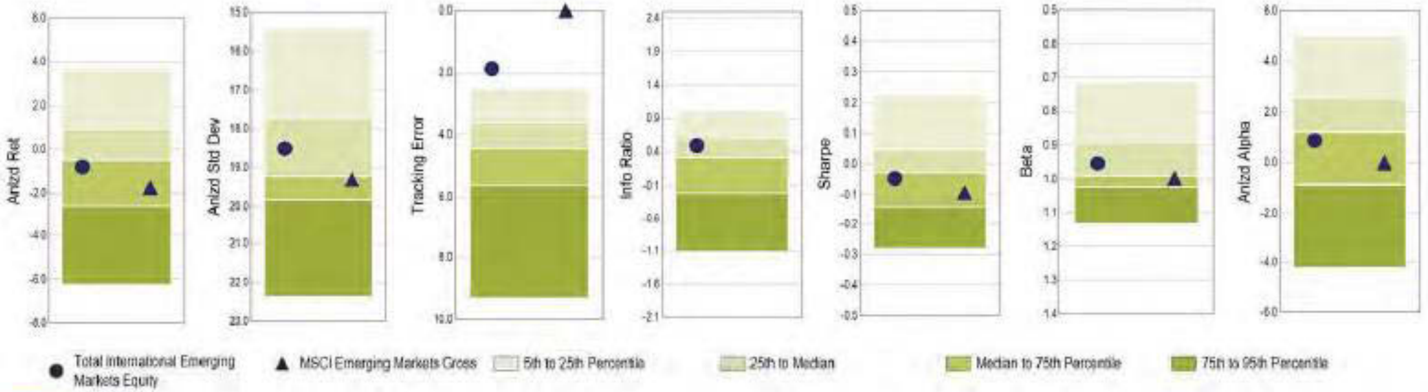


Emerging Market Equities

- Although Emerging Markets have underperformed DM, our Active Managers have been able to navigate the difficult environment and add excess return.
- ***William Blair (WB),*** who utilizes a bottom-up research process to select stocks of well-managed, quality growth companies which are expected to maintain superior growth and profitability. In addition to the fundamental analysis associated with security selection, WB views the economic strength of developing economies and industries as critical inputs to the portfolio construction process. WB has added approximately 500 bps of excess return over the last one and three years.
- ***Eaton Vance (EV),*** a quantitative manager who employs a rules based strategy, attempts to add excess return through the identification of mispriced securities and systematic rebalancing. EV has delivered positive excess returns 400 and 170 bps over the last one and three years respectively.

Private Equity Program Review

ASRS Staff Presentation

Karl Polen & Eric Glass

April 20, 2014

Outline

1. Background
   - The Private Equity Program
   - The Private Equity Team
   - Private Equity Strategy
2. Private Equity Performance
3. Portfolio Composition

Private Equity

- ASRS has allocated 7% of total assets (+/- 2%) to private equity as part of its strategic asset allocation
- ASRS began investing in private equity in 2007
- The NAV of PE assets was $1812 milllion on September 30, 2013
    - This is 5.47% of total fund and the NAV is $508 million below target funding
- We update pacing plans annually to adjust investment levels to achieve and maintain target funding
- Investment pace for 2014 is $600 million in new commitments

The Private Equity Team

- Karl Polen heads private market investing and Eric Glass is the portfolio manager for private equity and real estate
- Kerry White is the asset manager responsible for financial reporting, legal and tax matters
- Grosvener provides the back office and is the official book of record for valuations and return calculations
- Meketa is the private equity investment consultant providing advice on strategic matters and diligence support on new investments

Investment Strategy

- We focus in areas where capital is in demand and private market structures may be better suited to the situation
    - In past few years, we have placed significant capital in distressed style strategies as the U.S. emerges from the great recession
    - Energy is a current focus with tremendous demand for capital in development and infrastructure
    - We are focused on growth sectors including technology and health care
    - Companies with enterprise value less than $1 billion which generally are not well served or well suited to public market capitalization
    - Growing companies which need capital and assistance with professionalization of management
    - Take private of public company orphan divisions
- We have placed less emphasis on
    - Venture capital
    - Take private leveraged buyouts
    - Strategies with multiple exit routes

Manager Selection

- Performance criteria
  - Unlike public markets, research indicates persistence of performance in private equity
  - We consider absolute and relative performance through IRR, TVPI, quartile comparison to other private managers and public market equivalent returns
  - We consider consistency by charting returns at the deal level to consider dispersion, loss ratios and median returns
- Organizational criteria
  - We expect organizations to have talent depth appropriate to the opportunity they are pursuing
  - We expect organizations to have evolved a healthy team dynamic with proper sharing of economics and decision authority appropriate to their point in their life cycle
  - We prefer teams focused on adding value through operations
  - We prefer teams with specialized knowledge of industries, regions and, when appropriate, restructuring techniques
- Terms
  - Cost matters and when possible we negotiate fee reductions based on size or closing order
  - We prefer terms compliant with ILPA guidelines on governance, fee offsets, clawbacks and other such matters

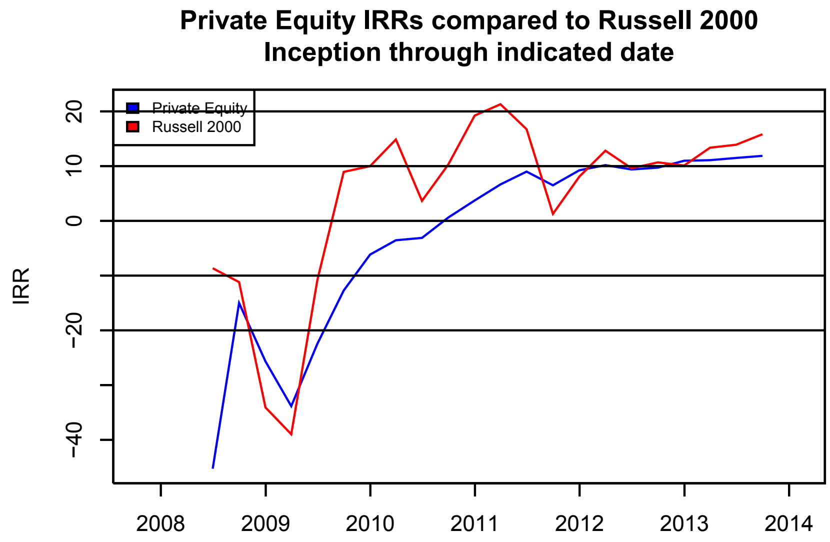
Performance Compared to Russell 2000 (September 30, 2013)

TWRs and IRRs Comparison to Russell 2000

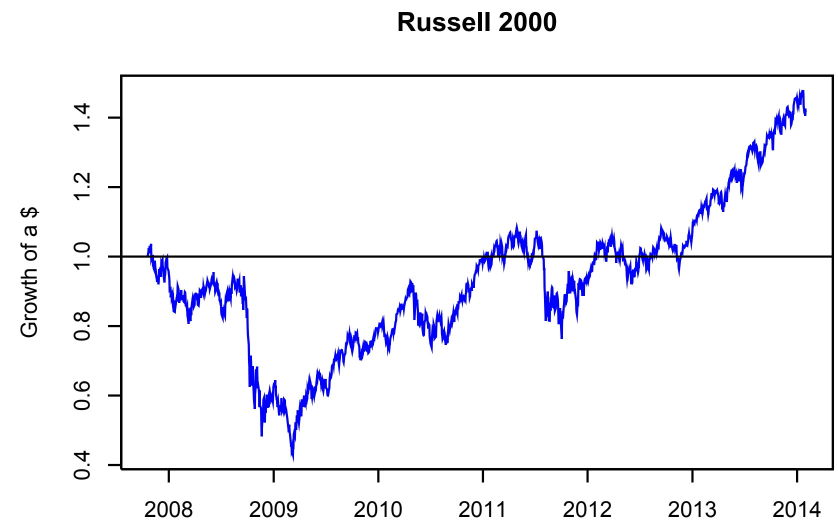
	One Quarter	One Year	Three Years	Inception
Private Equity TWR	3.39%	14.52%	15.50%	3.23%
Russell 2000 TWR	10.21%	30.06%	18.29%	6.40%
Private Equity IRR	3.92%	16.96%	15.69%	11.87%
Russell 2000 IRR	8.91%	28.13%	17.81%	15.83%

Current and Legacy Portfolios

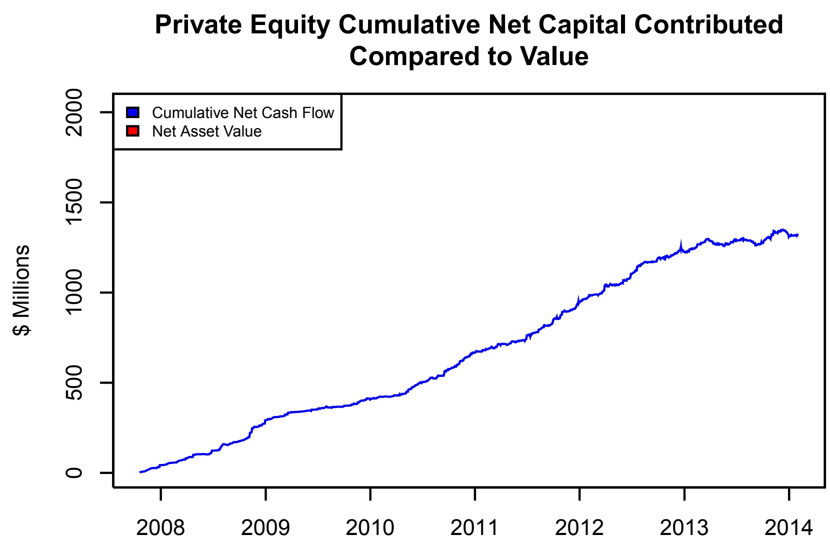
Fund	R2K PME	Fund IRR	R2K $Mtch IRR	Fund TVPI
Total PE	0.92	11.87%	15.83%	1.31
Total PE Legacy Portfolio	0.93	11.76%	15.11%	1.35
Total PE Current Portfolio	0.91	12.91%	22.49%	1.15



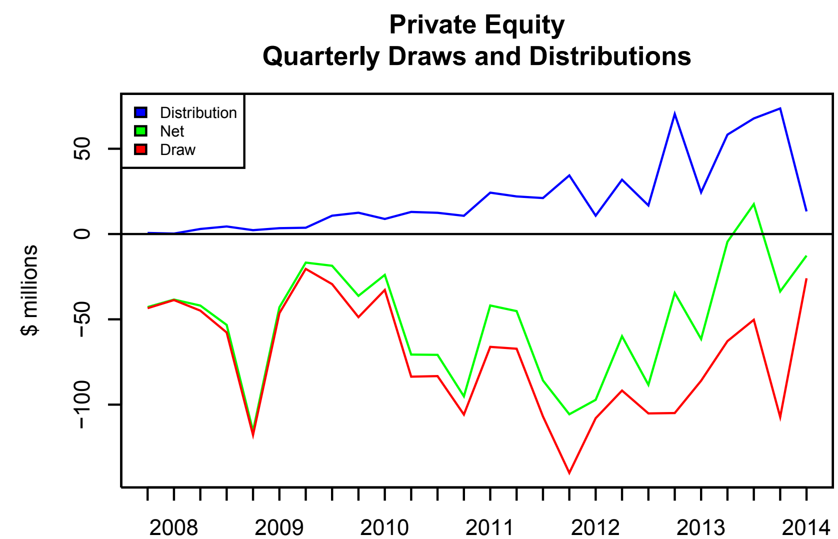
Private Equity IRRs compared to Russell 2000
Inception through indicated date
Private Equity
Russell 2000
IRR
20
10
0
−20
−40
2008
2009
2010
2011
2012
2013
2014



Russell 2000
Growth of a $
1.4
1.2
1.0
0.8
0.6
0.4
2008
2009
2010
2011
2012
2013
2014



Private Equity Cumulative Net Capital Contributed
Compared to Value
Cumulative Net Cash Flow
Net Asset Value
$ Millions
2000
1500
1000
500
0
2008
2009
2010
2011
2012
2013
2014

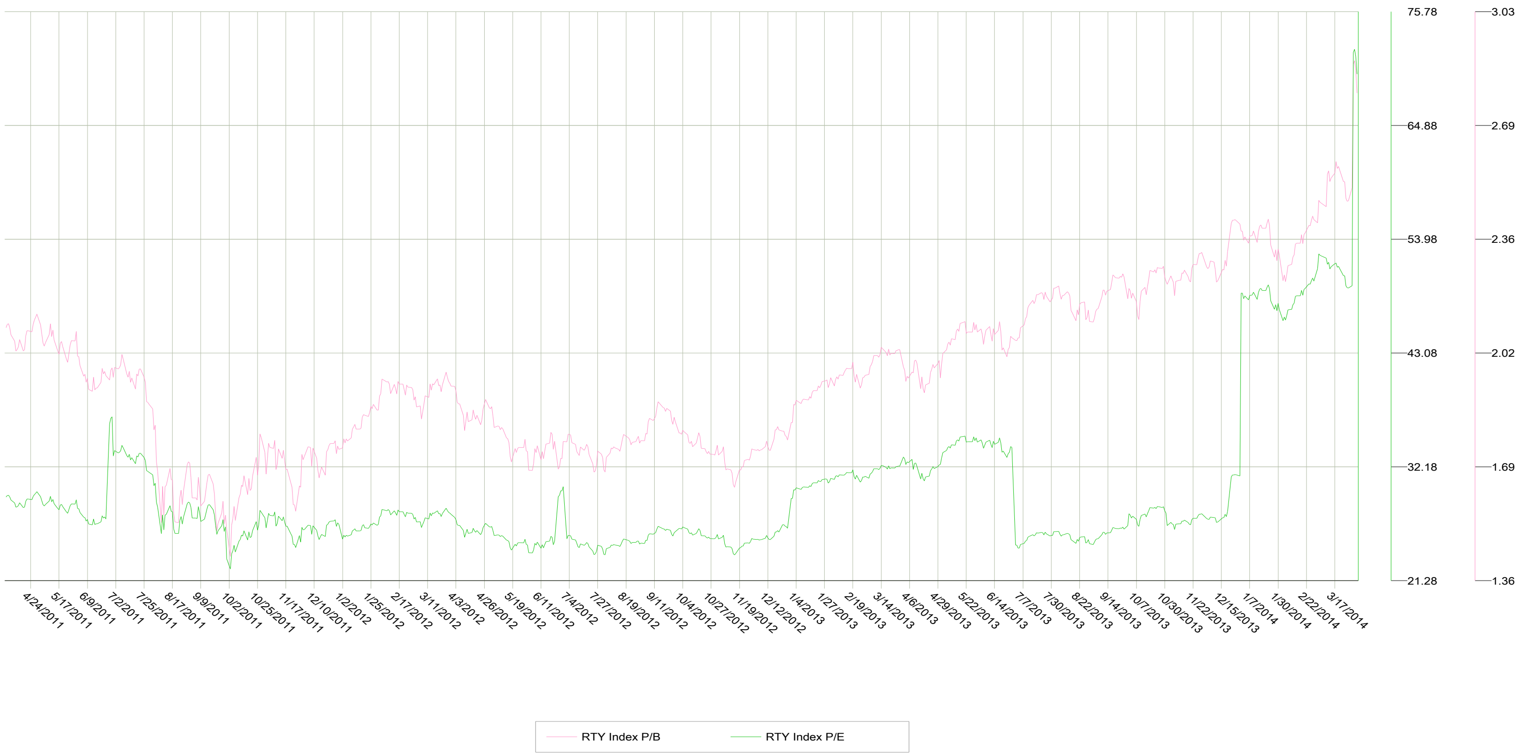


Private Equity
Quarterly Draws and Distributions
Distribution
Net
Draw
$ millions
50
0
−50
−100
2008
2009
2010
2011
2012
2013
2014

Russell 2000 is at historically high values

Bloomberg Graphical Financial Analysis

Date Range: 4/4/2011 - 4/4/2014 Periodicity: Daily



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Performance Compared to Other PE

ASRS PE TWRs compared to Burgiss and Thomson One

	# of Funds	One Qtr	One Year	Three Years
ASRS PE	72	3.39%	14.52%	15.50%
Burgiss	1583	3.63%	12.98%	12.38%
Thomson One	222	4.74%	17.30%	15.49%

Arizona State Retirement System

Fourth Quarter Report 2013

Portfolio IRR by Vintage Year Including Benchmarks

As of September 30, 2013

($ in millions)

			Venture Economics[1]			Ranking			
Vintage Year	Commitments as of 12/31/13	Net IRR[2]	Lower Quartile[3]	Median [4]	Upper Quartile[5]	4th Quartile	3rd Quartile	2nd Quartile	1st Quartile
2004	$7.7	22.05%	(0.31%)	4.54%	12.02%				X
2006	50.0	5.69%	1.27%	5.37%	9.68%			X	
2007	415.1	10.00%	5.30%	10.15%	15.37%		X		
2008	754.9	13.24%	6.02%	11.89%	16.69%			X	
2009	386.0	13.76%	6.22%	13.13%	17.69%			X	
2010	370.0	16.14%	5.15%	10.53%	20.66%			X	
2011	602.4	6.43%	(4.48%)	7.98%	13.57%		X		
2012	385.0	30.55%	(20.41%)	(6.92%)	6.41%				X
2013	465.0	(60.77%)	(75.92%)	(22.19%)	13.59%		X		
Total	**$3,436.1**	**11.89%**				**0**	**3**	**4**	**2**

ASRS Portfolio by Vintage

ASRS Portfolio Commitments by Vintage

	Commitment $	# of Funds	Commitment/Fund
2006	50	1	50
2007	483	15	32
2008	680	14	49
2009	386	8	48
2010	355	8	44
2011	659	12	55
2012	350	6	58
2013	515	9	57
	3,143	67	47

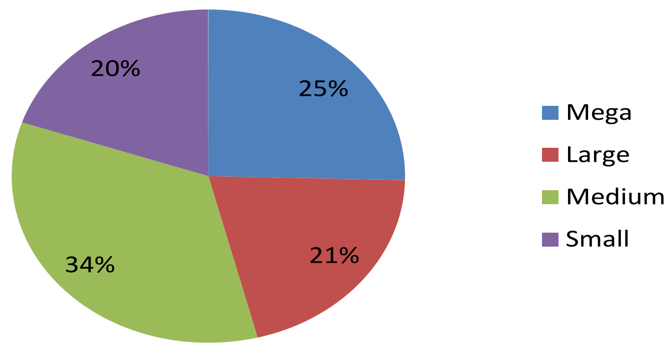
ASRS staff will present 1 more fund to the Private Markets Committee in December to bring the total commitments to $565M

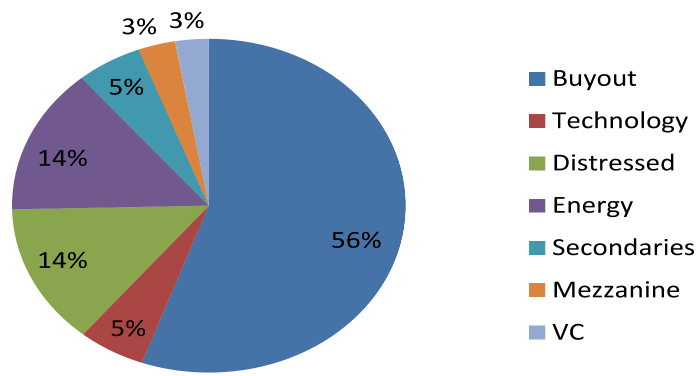
4

ASRS Commitments by Style

ASRS Portfolio Commitments by Style

	Commitment $
Total Mega Buyout	462
Total Large Buyout	375
Total Medium Buyout	823
Total Small Buyout	360
Total Buyout	1,735
Total Technology	180
Total Distressed	447
Total Energy	465
Total Secondaries	176
Total Mezzanine	100
Total Venture Capital	90
Total	3,278

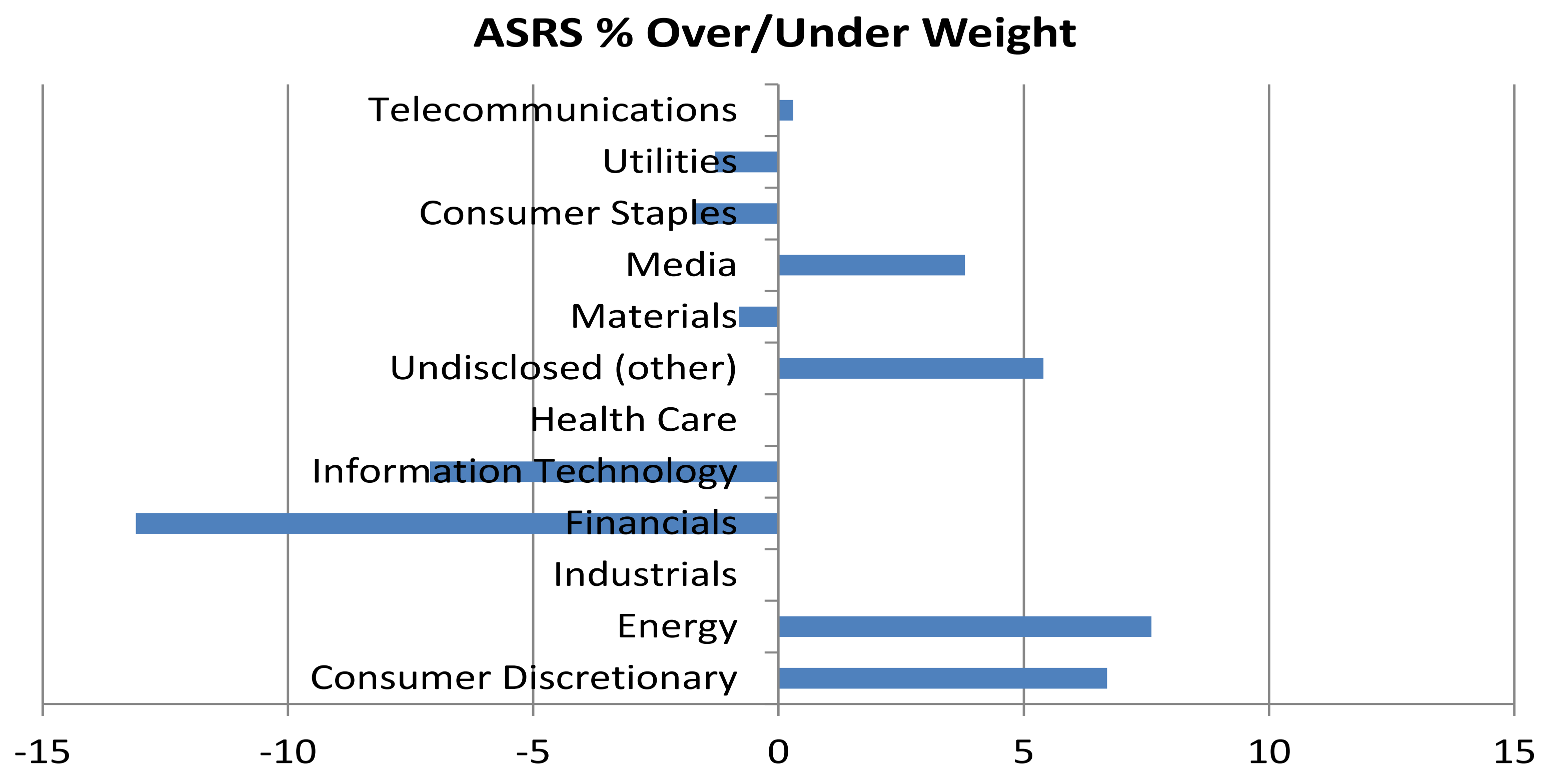




5

ASRS PE Industry Sectors Compared to R2K

ASRS Portfolio Commitments vs R2K



6

Arizona State Retirement System
Investment Beliefs

FRAME OF REFERENCE

The following *Investment Beliefs* have been established to ensure the development of congruent and synergistic investment strategies, and to ensure the effective and efficient allocation of resources. These *Investment Beliefs* determine the general paradigm within which investment strategies are developed, investment ideas are reviewed, and investment decisions are implemented.

Modifications to these *Investment Beliefs* will occur if experiential, academic, conceptual, and/or practical perspectives suggest that a superior belief system exists.

INVESTMENT BELIEFS

1. Asset Class Decisions are Key

In general, decisions with respect to which asset classes and sub-asset classes to invest in, and the allocations to these asset classes and sub-asset classes, have a greater impact on total fund investment returns than decisions in which specific securities to invest.

2. Theories and Concepts Must be Sound

Over longer periods of time, investment outcomes (e.g. rates of return, volatility) conform to logical theories and concepts. Significant deviations (e.g. internet bubble, pre-subprime erosion of risk premiums) from theoretically and conceptually sound investment constructs are usually not sustainable and are typically self-reverting.

3. House Capital Market Views Are Imperative

The development and articulation of sound *House Views* (e.g. views on interest rates, corporate spreads, asset valuations) will ensure consistency among investment decisions, clarity of investment direction, baselines for debates, and conformity of understanding.

4. Investment Strategies Must be Forward Looking

Investment strategies will be developed based on forward-looking insights, rather than simply on successful strategies of the past.

Asset class valuations and security valuations are significantly affected by endogenous outcomes (e.g. earnings, GDP growth rates, competitive barriers) that are probabilistic, and these outcomes are typically well analyzed by the investment industry.

Asset class valuations and security valuations are also significantly affected by random outcomes (e.g. natural disasters, certain supply & demand shocks) that are virtually unpredictable, and these outcomes are typically not analyzed directly by the investment industry.

Asset class valuations and security valuations are also significantly affected by exogenous outcomes (e.g. foreign policies, global cultural interactions) that can possibly be modeled, and these outcomes are typically not analyzed by the investment industry.

5. Public Markets are Generally Informationally Efficient

Asset Class Valuations

Asset class valuations (e.g. stock market levels versus interest rate levels) are often in equilibrium with one another, but anomalous situations do occur which result in disequilibria between asset class valuations. These disequilibria offer valuable investment opportunities which we will pro-actively seek and capitalize on.

Created June 2008; Revised June 2013

Security Valuations

Security valuations (e.g. IBM versus Cisco) are often in equilibrium with one another, but private markets and anomalous public market situations do occur which result in disequilibria between security valuations. These disequilibria offer valuable investment opportunities which we will pro-actively seek and capitalize on.

The extent of informational efficiency varies across asset classes.

Private markets offer significant opportunities for asset mispricing and manager excellence which we will pro-actively seek and capitalize on.

6. Market Frictions are Highly Relevant

Market frictions (e.g. management fees, carried interest, revenue sharing, expenses, costs, transaction spreads, market impacts, taxes, commissions) can be significantly detrimental to investment performance and as a result transactions will be initiated only to the extent there is a strong level of conviction that they will result in increased investment returns or decreased risks net of all market frictions.

7. Internal Investment Professionals are the Foundation of a Successful Investment Program

In-house investment management capability engaged in direct portfolio management results in superior investment decision-making.

In-house investment management pro-actively monitors capital markets in order to determine mispricing opportunities & allocate capital and will successfully increase risk adjusted returns.

In-house investment professionals are more closely aligned with, and have a better understanding of, the purpose and risk & reward tolerance of the ASRS than external parties.

In-house investment professionals will impact direct investment negotiations, better align economic interests, and influence investment industry conditions (e.g. private deal structures, fee levels, introduction of innovative products & strategies).

8. External Investment Management is Beneficial

External investment organizations can often offer greater expertise, resources, and/or flexibility than internal personnel for various investment strategies.

9. Investment Consultants

Investment consultants will be effectively utilized in the following four general categories, and utilization of consultants will be focused on situations where there is a demonstrable need in at least one of the four areas:

- Independence: When oversight or controls should be enhanced
- Perspective: When internal perspectives are not broad enough
- Special Skills: When internal skills are not deep enough
- Resource Allocation: When internal resources are not broad enough

10. Trustee Expertise

Trustees often have expertise in various areas of investment management, and this expertise should be utilized while ensuring separation between Board oversight and staff management.