Economic Cycles & Asset Class Returns

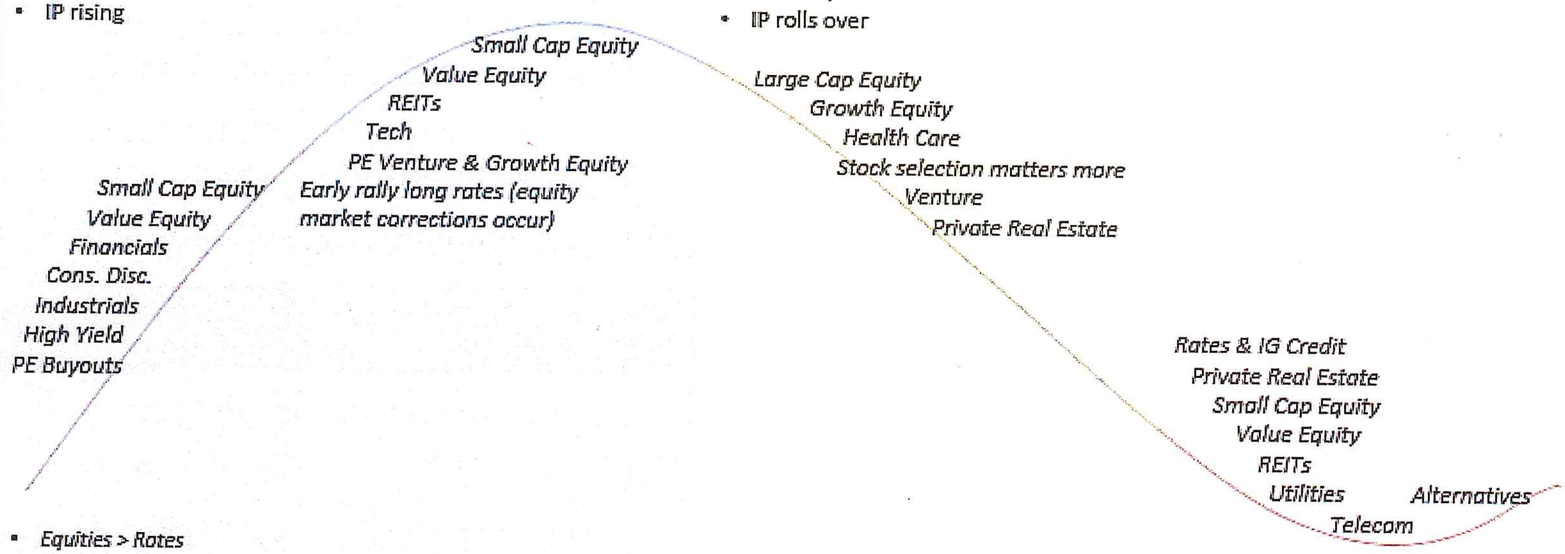
Howard Marks: "Rule number one: Most things will prove to be cyclical. Rule number two: Some of the greatest opportunities for gain and loss come when other people forget rule number one ."

Recovery
- Rates still low/falling
- Inflation still low/falling
- YC steepens
- Unemployment high
- Inventories low
- Capex rising
- Profits bottom & rise
- Credit spreads tighten
- IP rising

Mid
- Rates rise slowly
- Inflation rising
- YC flattens
- Unemployment falling
- Inventories rising
- Capex accelerates
- Profits accelerate
- IP rebounds/peaks

Late
- Rates rising/peak
- Inflation rising
- YC flat or inverted
- Unemployment falling/bottom
- Inventories rising/peak
- Capex rising/peak
- Profits rising/peak
- Credit spreads widen
- IP rolls over

Contraction
- Rates falling
- Inflation falling
- Unemployment rising
- Inventories falling
- Capex falling/bottom
- Profits falling
- IP falling



- *Equities > Rates*
- *Equities > HY*
- *SC > LC*
- *Value > Growth*
- *Financials and CD outperform due to low rates*
- *Publics > Alternatives*

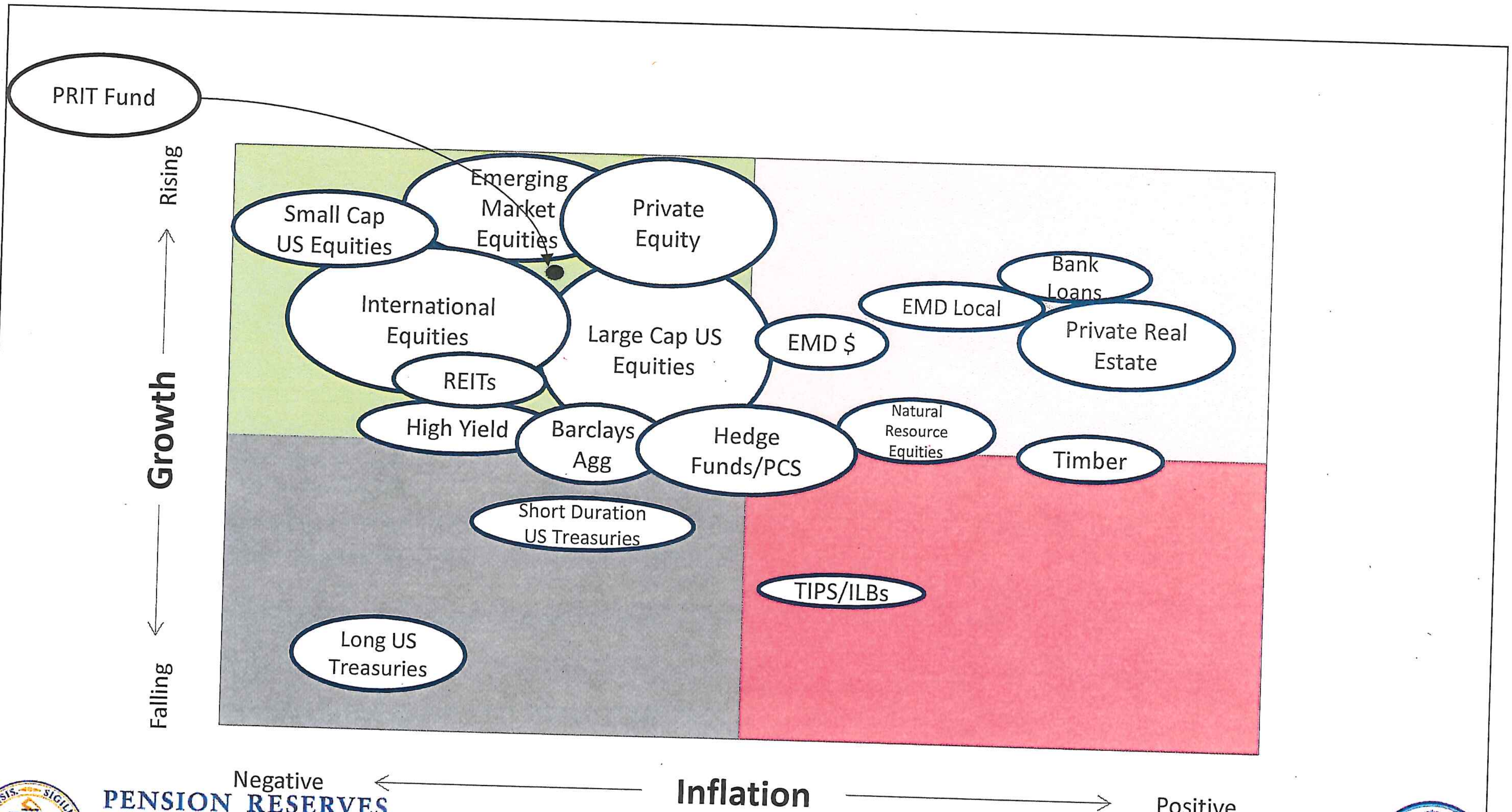
- *SC > LC*
- *Value > Growth*
- *REITs outperform w/ SCV*
- *Equity market correction*
- *Early rally long rates*
- *Financials, Industrials, Materials, Tech outperform*

- *LC > SC*
- *Growth > Value*
- *Rally long rates*
- *SCV/REITs underperform*
- *Int'l > US*

- *Rally long rates*
- *HY > Equities*
- *SC > LC*
- *Value > Growth*
- *Alternatives > Publics*

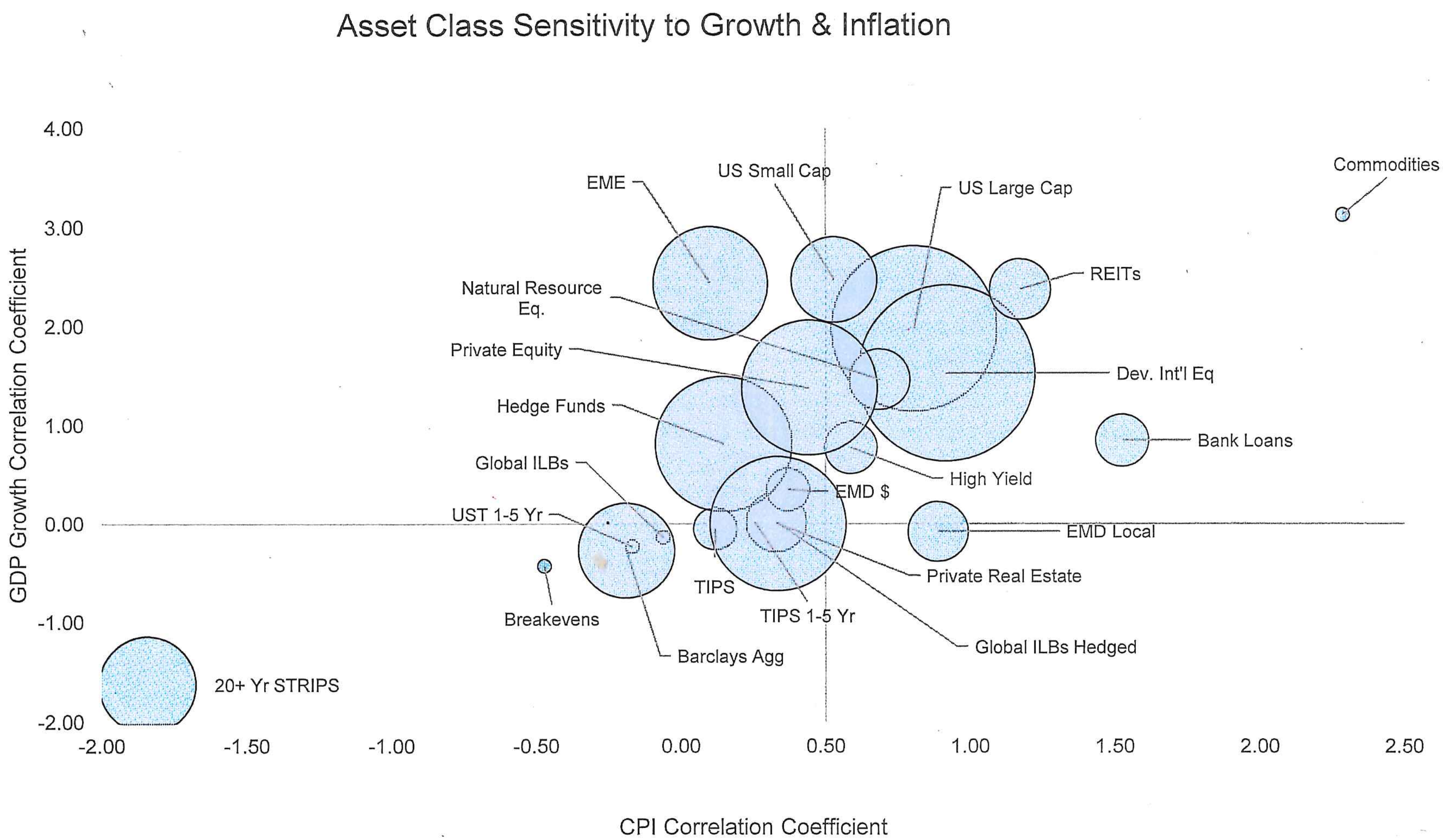
Asset Class Performance & Inflationary Regimes

Deflationary | Stagflationary | Inflation Between 0% - 5% | High Inflation (Over 5%) + Growth



PENSION RESERVES INVESTMENT MANAGEMENT BOARD

Asset Class Sensitivity to Growth & Inflation



- Quarterly data since 2000.
- Doesn't include stagflationary time periods. Homogeneous time period - narrow distribution of CPI/GDP

PENSION RESERVES INVESTMENT MANAGEMENT BOARD

Asset Allocation 2016			Asset Class Teams			
	Asset Class	*YTD Returns*	*Top Drivers of 2015 Returns*	*2016 Asset Class Outlook*	*Indicators/Data Supporting Outlook*	*Risks to Outlook*
Equities	US Large Cap	-5.3%	Valuations were stretched, market had not corrected since Oct. 2011. Strong $ hurt exporters & multis.	Expect average 5-7 year returns. Hold Large Caps until AA model Sell Signal.The Fed remains accomodative. Valuations have improved since year-end, but are still above cycle average. Large Caps outperform SC later in economic cycle.	SP500 P/E has come down to 15.1 from 16.2 at the beginning of the year. The 5 and 10 year SP500 P/E averages are 14.0 and 14.1	Fed could remain accomodative for some time. Earnings growth (NTM) has improved to 7.2% from 4.2% earlier this year.
	US SMID Cap	-6.0%	Valuations were stretched, SC Energy hit hard.	Expect average 5-7 year returns. Earnings growth estimates are a third lower vs. one year ago, while P/E has risen 4%. US Consumer confidence high. Unemployment steadily dropping.	R2500 earnings growth (NTM) at 14.7% vs. 21.5% a year ago. P/E 18.8 vs. 18.0 a year ago (LTA = ~17). Consumer confidence 103, not seen since mid-2007.	Fed could remain accomodative for some time. SMID caps more sensitive to rates and benefit from M&A activity.
	Developed Non-US	-5.3%	Strong Local returns with Central Bank stimulus in Europe and Japan. Weak FX as USD appreciates.	Expect average 5-7 year returns. Accomodating policy supportive of equities. Another 13% FX depreciation unlikely. Weaker currency supportive to exporters. Earlier in economic cycle.	Profit margins have risen to 7.6%, the highest since mid-2011. EUR/USD has been fairly stable since Jan. 2015. 10 year Gov. 0.58% in Europe.	Euro structural problems remain unresolved (i.e. Greece). China: 18% of Japanese exports and 5.4% of German exports go to China. Abenomics may not be enough.
	Emerging Core	-15.5%	Serious problems with Chinese & Brazilian economy. Commodity exporters hit hard. Depreciating FX.	Expect average 5-7 year returns. While price has dropped, so has earnings. EM P/E similar to one year ago, and long-term averages (LTA). Growth similar to 2014, but below LTA.	The EM P/E is 10.7 vs. 10.8 one year ago (LTA = ~11). Earnings growth (NTM) at 10.1% vs. 10.4% a year ago (LTA = ~13%).Many EM countries are large exporters to China. Yuan devaluation?	Rebound in EM FX. Problems in China not as bad as feared. Major stimulative policy from Chinese Gov't.
Fixed Income	US Long Treasury	-2.7%	Rates backed up mid year as US Economy showed signs of life but have rallied recently on back of heightened global growth concerns and lack of Iinflationary pressures	Expect above average 5-7 year returns. Yields are slightly higher than year end but can retrace lows of Jan.15 if growth concerns persist.	30 year yields fell to 2.2% in January. Inflation remains subdued. STRIPS offer negative correlation to equity-like assets.	External factors undermine correlation benefit. US reaches liftoff. Fed's policy delay leads to inflation down the road.
	US TIPS	-0.8%	Real rates have backed up and inflation has been near zero	Expect average 5-7 year returns. Real yields may continue to grind higher while inflation expectations may remain in check	Headline CPI is low, but the low base makes the positive YoY change more likely. FWD Breakeven inflation is 1.7%	US reaches liftoff. Fed's policy delay leads to inflation down the road.
	Global ILBs	-0.1%	Negative yield and virtually zero inflation across global markets.	Expect average 5-7 year returns. With US the "leader" of global growth, inflationary pressure in other developed markets are likely to remain muted for 2016	European inflation is -0.1% and Japan is 0.2%. Euro BE's are about 1% while Japan is 0.8%	China avoids a hard landing and commodities recover leading to an uptick in inflation. Europe & Japan demonstrate willingness to create inflation.
	US Aggregate	1.1%	Credit spreads have widened, rates virtually unchanged, and yield haven't changed meaningfully.	Expect average 5-7 year returns. Relative stability in credit spreads and slight increas in front end rates	Credit spreads are at 160 but have gotten as wide as 225 during post crisis recovery (Nov. 2011).	US fails to reach liftoff. Spreads widen further and duration benefit is not a sufficient offset.
	US High Yield	-2.5%	Energy (+14% of index) has dragged down returns. Spreads are 160bps wider.Much of which is due to the Energy sector.	Expect below average 5-7 year returns. Sustained lower levels of Energy prices will start to cause pain in HY. Uptick in defaults and pressure on financing.	At 662 spreads are cheap to 5r average with 1.3 z-score. Period high of 841 (Sept. 2011) achievable if credit fundamentals turn meeaningfully negative	US Energy rebounds. US continues to muddle along. Growth is low but positive and Fed remains on hold leading investor to flock back into US HY.
	Bank Loans	-0.5%	Capital structure, seniority, and lower interest rate sensitivity were positive factors.	Expect average 5-7 year returns. Sluggish growth, sustained low oil prices, no growth to support IG, flurry of commodity-linked downgrades.	Spread of 547 is 50bps cheap to previous 10yr history. Floating rate, limited energy exposure and cap strucutre provide better support than HY market.	Rate increase without significant economic improvement. Asset class is historically more sensitive to liquidity and could be a disrtuption. Weakening credit fundamentals beyond energy sector could impact BL
	EM $	-0.3%	Spreads widened 70bps. China impact, Commodity prices, Dollar strength	Expect below average 5-7 year returns. Fundamental concerns in Brazil, impact of slowing China demand and low commodity prices will continue to be felt. Outflow of capital due to risk avaersion, Fed tightening or substituion effect into domestic assets which have cheapened will challenge EMD markets	Valuations are cheap. However, warranted given fundamentals. Impetus for recovery not clear.	Rebound in EM FX. Problems in China not as bad as feared. Major stimulative policy from Chinese Gov't.
	EM LC	-14.9%	Commodity dependent countries, FX depreciation, geopolitical risk in Brazil & Russia, etc.	Expect below average 5-7 year returns. Fundamental concerns in Brazil, impact of slowing China demand and low commodity prices will continue to be felt. Outflow of capital due to risk avaersion, Fed tightening or substituion effect into domestic assets which have cheapened will challenge EMD markets	Valuations are cheap. However, warranted given fundamentals. Impetus for recovery not clear. Risk of further currency devaluation.	Rebound in EM FX. Problems in China not as bad as feared. Major stimulative policy from Chinese Gov't.
	Distressed Debt	0.4%	Spreads widening, defaults stay low, buyout activity frothy driving leveraged lending	Still no outright default cycle but for some energy names, cycle of loan sales continues	Spreads widening (energy); low default rate; health of Europe financials driving loan sales	Dislocation in credit market
Alternatives	US Private Equity	9.0%	Earnings Growth, Liquid capital markets, weakened Euro	Harvesting from older funds tapers, value changes settle down with lower earnings growth, buyout activity slower	Value and credit multiples high compared to history. Developed market growth expectations are low. PRIM 06 - 08 funds running off, PRIM o/weight large funds	Public equity markets continue to rally driving pe higher; pe market may have re rated risk, driving up prices in short term
	US Core Real Estate	6.7%	6/30 NCREIF YOY is 13%. Expect continued strength through YE as appraisals capture recent transaction cap rates. Returns pretty consistent across types. Industrial led (14.8%) while apartments lagged at 11.6%. Space absorption/moderate rent increases, cheap debt, capital flows, low construction.	Five year NCREIF return is 12.7%. 20 year is 9.75%. We anticipate a 7-9% unlevered return in 2016. This reflects a 3-4% cash yield. We feel that cap rates will be flat but the appraisal lag and some rent growth will translate into additional appreciation. Acquisition returns are pricing at a 5.5-6.5% (IRR) on a 10 year underwriting. We like the supply constraints and increasing demand in the market. Vintage year risk is heightened but we are comfortable allocating capital in this environment.	Employment data, new supply, capital flows, inflation indicators	Interest rates not supported by economic growth, new supply, longer term structural changes in the use of real estate (office, retail focus).
	US REITs	-4.6%	Global benchmark at 0.05% (USD) YTD vs S &P at -0.4%. The good - Asset appreciation, rent and occupancy increases. Low interest rates. Acrretive development. Europe has been a significant driver of global REIT returns at 9.4% YTD vs the US at -0.4%. The bad - high volatility primarily driven by pending (?) interest rate rises.	We expect continued positive returns in Europe due to strong capital flows driven by low rates, favorable exchange rates, recovering fundamentals and valuations. U.S. returns will be flat with continued rate volatility. Buying opportunities will exist on relationship to NAV. We are not bullish on Asia given China impact on region but feel that pockets of opportunity may exist based on strong security/ type/city selection.	Good fundamentals, low rates. Valuations vs equities and bonds look expensive in historical context. Discount to NAV exist - how do we feel about NAV?	Interest rates not supported by economic growth, new supply (including on the companies balance sheets). Reduction in capital flows (REIT liquidity).
	Timber	1.3%	6/30 NCREIF YOY is 10%. The regions are in line. Recovering timber prices. Southern pulp prices have increased ahead of saw timber on increasing consumption/economic growth. Saw timber lagging due to housing. Asian demand (YTDI) driving PNW pricing. Discount rates have compressed due to a lack of transactions and heightened expectations on housing market.	Five year NCREIF return is 6.1%. 20 year is 7.8%. We feel that returns over the next 3-5 years will exceed the five year average due to further recovery in log prices. The recovery will be mixed in the short term (1-2 yrs) . Negatives are Chinese and Australian demand concerns and some questions are demand/demographics in the U.S. Positives are growing housing starts, low mortgage rates, Canadian supply story, improving Europe. Currency will create winners and losers.	Housing data, consumption data, supply data, interest rates	Housing starts, interest rates impact on valuation and mortgage demand. Millennial generation demand - preferences, savings, educational debt. Timber on the stump.
	Hedge Funds	0.5%				
	Portfolio Completion Strategies	-3.4%				

Executive Limits Analytics 8/31/2015

		Total Risk				% Contribution Total Risk Total Plan				Active Risk			
	Dates	11/30/2014	2/28/2015	5/31/2015	8/31/2015	11/30/2014	2/28/2015	5/31/2015	8/31/2015	11/30/2014	2/28/2015	5/31/2015	8/31/2015
Total Plan	CORE FIXED INCOME	10.76	11.35	11.33	10.58	-1.00	-0.69	-1.15	-0.78	0.50	0.60	0.56	0.62
	GLOBAL EQUITY	13.63	13.37	12.84	12.60	66.51	66.78	66.37	65.33	0.52	0.55	0.53	0.54
	DOMESTIC EQUITY	13.56	13.58	13.19	12.65	43.81	44.24	42.77	41.76	0.33	0.36	0.33	0.35
	INTERNATIONAL EQUITY	14.61	14.53	14.19	14.14	38.54	39.46	41.73	42.02	0.94	1.01	1.04	1.06
	EMERGING MARKETS	16.33	15.59	14.72	15.34	17.65	16.31	15.50	16.23	0.96	1.34	1.59	1.47
	HEDGE FUNDS	3.18	3.32	3.22	3.22	2.72	2.80	2.85	2.69	2.12	2.15	2.15	1.99
	PRIVATE EQUITY	13.12	13.03	12.63	12.26	14.81	14.61	14.27	14.89	0.00	0.00	0.00	0.00
	REAL ESTATE	9.14	9.16	8.82	8.80	7.14	6.23	7.30	7.57	1.82	1.76	1.80	1.95
	TOTAL TIMBER-NATURAL RESOURCES	9.71	9.77	9.28	8.76	3.77	3.72	3.85	3.65	5.24	4.99	5.18	5.62
	VALUE-ADDED FIXED INCOME	6.36	7.11	6.94	6.72	6.05	6.54	6.50	6.65	0.53	0.47	0.53	0.48
	TOTAL PLAN	8.65	8.48	8.19	8.10	0.00	0.00	0.00	0.00	0.57	0.67	0.59	0.55

Executive Limits Analytics 8/31/2015

		Beta				Monte Carlo Var (on Month 95%)				Effective Duration			
	Dates	11/30/2014	2/28/2015	5/31/2015	8/31/2015	11/30/2014	2/28/2015	5/31/2015	8/31/2015	11/30/2014	2/28/2015	5/31/2015	8/31/2015
Total Plan	CORE FIXED INCOME	-0.21	-0.23	-0.24	-0.21	6.29	6.36	6.45	5.73	16.75	17.14	16.94	15.65
	GLOBAL EQUITY	0.98	0.95	0.93	0.93	6.50	6.32	6.05	5.93	0.45	0.44	0.21	0.03
	DOMESTIC EQUITY	1.04	1.03	1.03	1.02	6.49	6.51	6.23	6.09	0.55	0.65	0.31	0.04
	INTERNATIONAL EQUITY	0.92	0.87	0.86	0.87	6.77	6.72	6.76	6.67	0.00	0.00	0.00	0.00
	EMERGING MARKETS	0.97	0.89	0.79	0.82	7.83	7.41	6.98	7.12	0.00	0.00	0.00	0.00
	HEDGE FUNDS	0.21	0.22	0.22	0.22	1.52	1.59	1.52	1.57	0.00	0.00	0.00	0.00
	PRIVATE EQUITY	0.99	0.97	0.97	0.96	6.31	6.36	5.96	5.80	0.00	0.00	0.00	0.00
	REAL ESTATE	0.41	0.36	0.35	0.34	4.35	4.49	4.17	4.36	0.00	0.00	0.00	0.00
	TOTAL TIMBER-NATURAL RESOURCES	0.62	0.62	0.61	0.56	4.64	4.67	4.41	4.24	0.00	0.00	0.00	0.00
	VALUE-ADDED FIXED INCOME	0.43	0.47	0.46	0.45	3.08	3.38	3.25	3.22	4.93	4.03	4.13	4.05
	TOTAL PLAN	0.62	0.59	0.59	0.59	4.12	4.08	3.78	3.86	2.77	2.99	2.66	2.38

Total Risk: The total (gross) risk to an asset, which is the standard deviation of the asset's total return distribution, expressed in percent and annualized

Active Total Risk: The annualized expected standard deviation of the differential return between the portfolio and the benchmark.

Beta: The systematic risk coefficient that expresses the expected response of asset or portfolio excess return to excess return on a market portfolio.

Value at Risk (VaR) is the maximum loss not exceeded with a given probability defined as the confidence level, over a given period of time.

Monte Carlo simulation implements the great variety of the outcomes and scenarios to define VaR, and, therefore, works in a wider variety of the situations.

Effective Duration: A duration calculation for bonds with embedded options. Effective duration takes into account that expected cash flows will fluctuate as interest rates change.

Marginal Contribution to Risk: Marginal contribution to risk is an asset's contribution, on the margin, to a particular risk characteristic of a portfolio. It measures the change in that characteristic caused by a one percent change in that asset's or group's percent holding (while shorting an equal amount of cash to keep all other asset weights constant).

Limit Legend:

XX	outside absolute limit
XX	outside relative limit
XX	outside both relative and absolute limit
XX	warning for absolute limit
XX	outside relative limit
XX	warning for absolute limits and outside relative limits
XX	within absolute limits
XX	within absolute limits but outside relative limits
XX	no absolute limits
XX	no absolite limits but outside relative limits