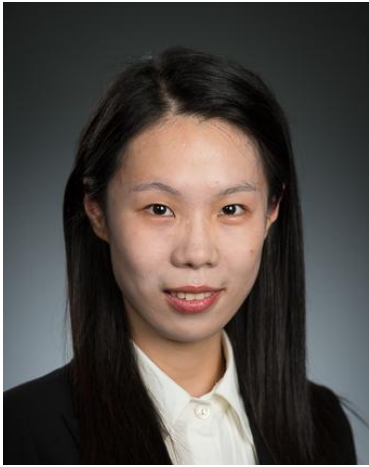


GRADUATE SIMFUND 2015-16

December 4th 2015

INTRODUCTION



Charlize Zhou



James Kohlbeck



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Donald Bricker



Venkata Ghanta



Camden Forgia



Rhett Dayton

AGENDA

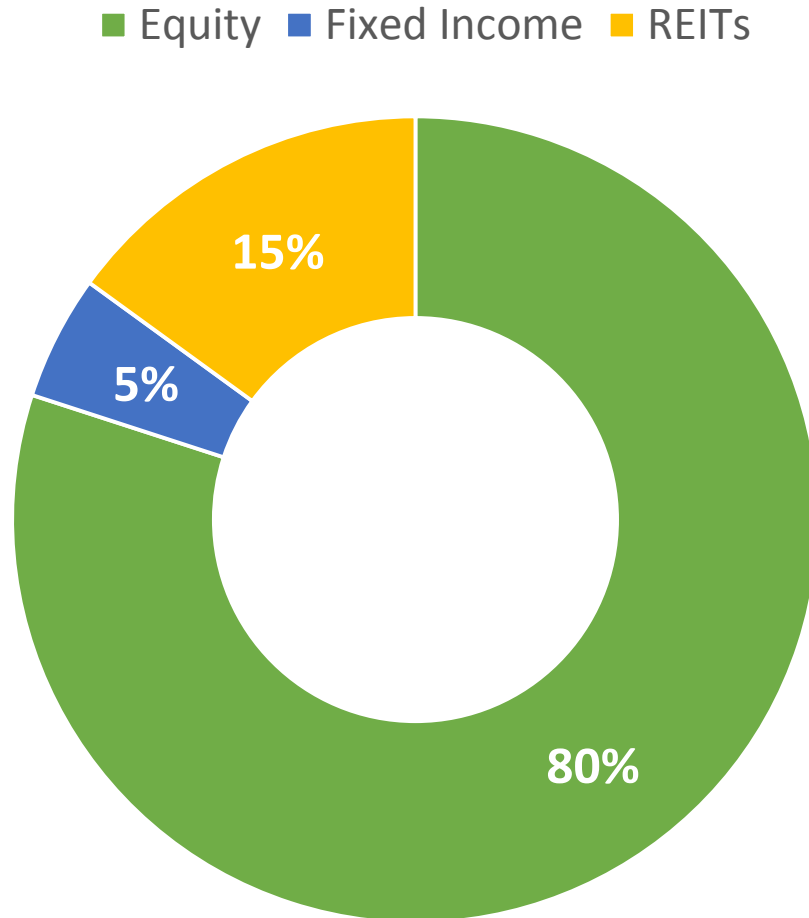
- Objective
- Asset Allocation
- In depth analysis
 - Equity
 - REITS
 - Fixed Income
- Next Steps

OBJECTIVE

- Apply range of course principles to SIMFUND
- Understand the practical challenges
- Utilize resources to maximize learning while managing scope of the fund activities

ASSET ALLOCATION

The team decided to invest in Equity, Fixed income and REITs after evaluating other asset classes



Other Asset Classes Considered

- Commodities
 - High volatility
 - High geopolitical risk

Equity

- Quantitative Strategy

REITs

- Fundamental Analysis

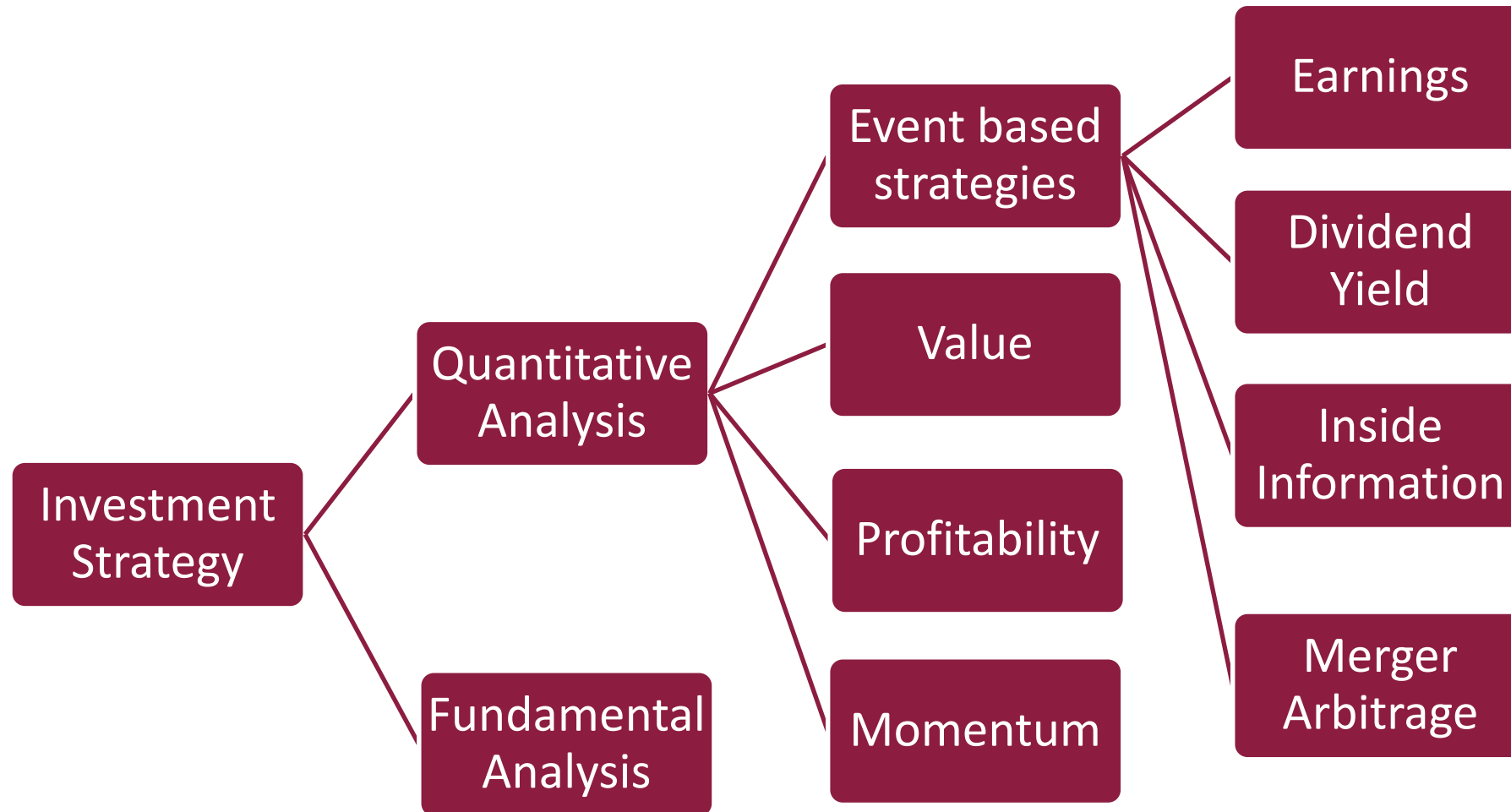
Fixed Income

- Passive

EQUITY STRATEGY

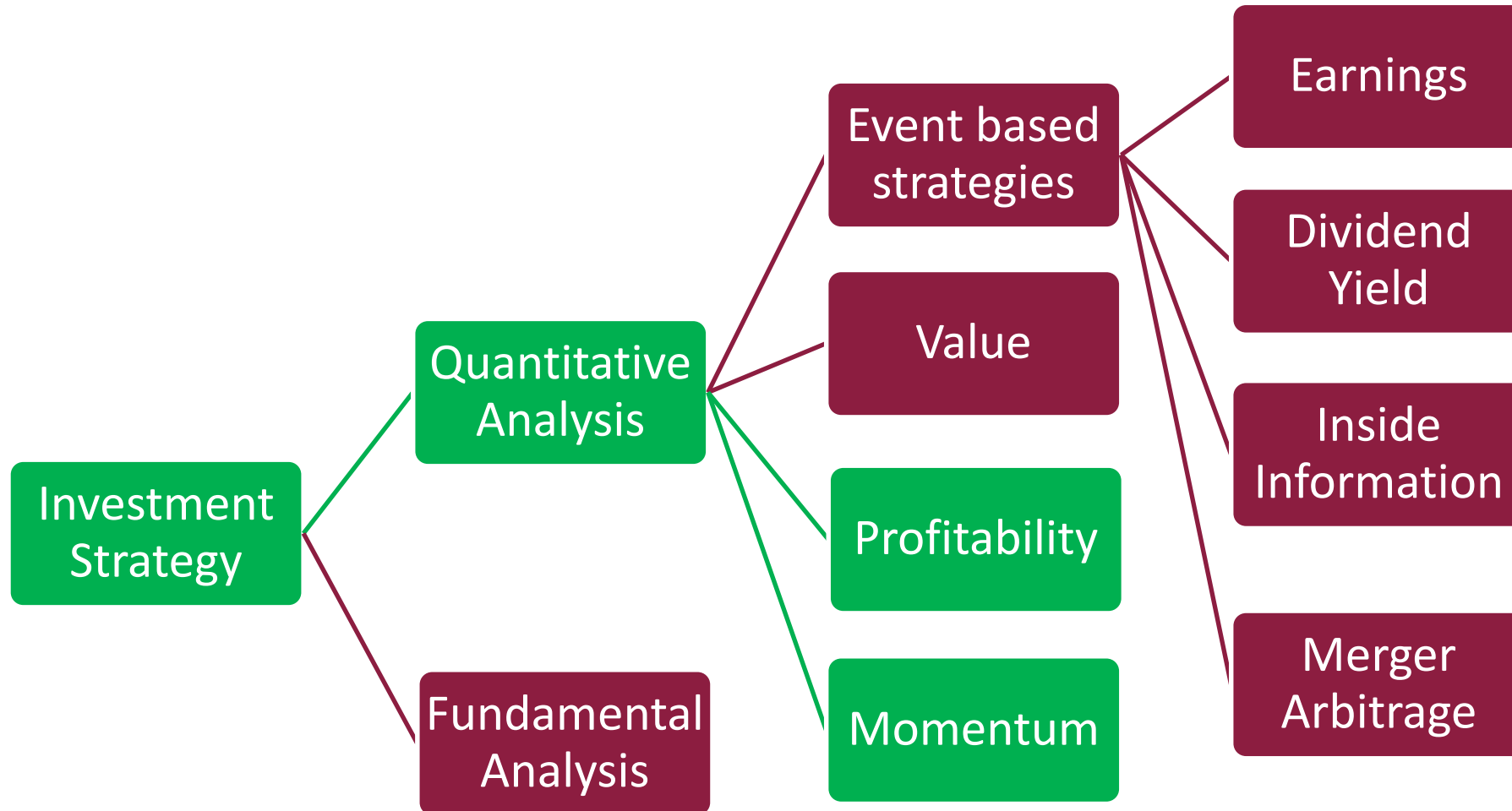
MOTIVATION

We evaluated several options before narrowing down on the quantitative strategy



MOTIVATION

We evaluated several options before narrowing down on the quantitative strategy



PROFITABILITY AND MOMENTUM

Profitability

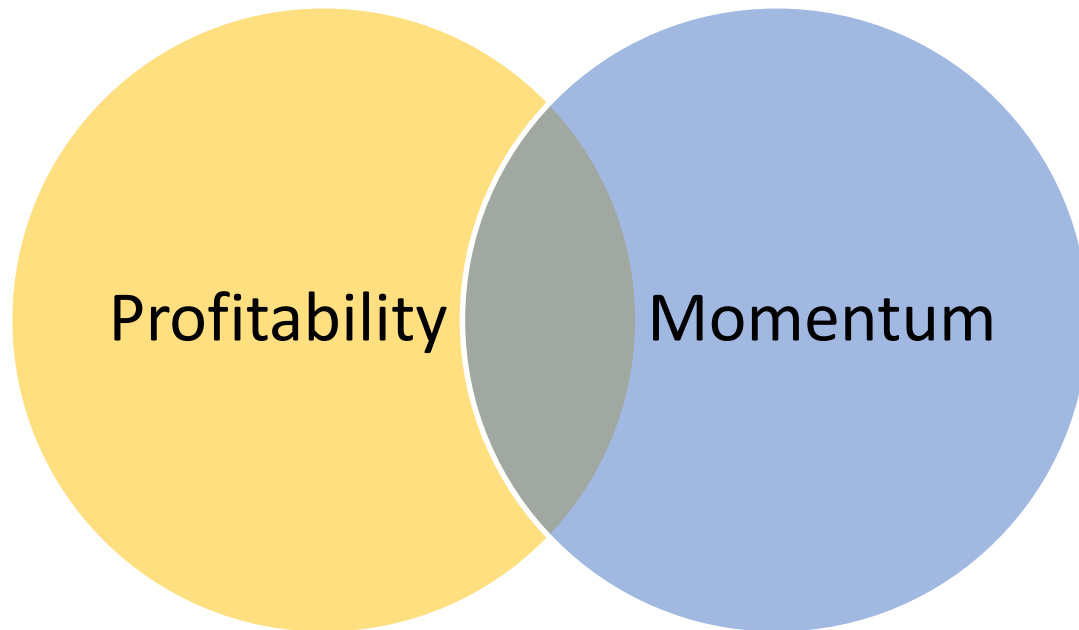
- *The other side of value: The gross profitability premium (2011)*
-Robert Novy-Marx
- Underlying thesis: ***Firms with productive assets should yield higher returns than those with unproductive assets.***

Momentum

- *Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency (1993)*
-Narasimhan Jegedeesh and Sheridan Titman
- Underlying thesis: ***Winners will outperform losers***

EQUITY STRATEGY

A growth investment strategy focusing on profitability and momentum of stocks was selected



- Profitability of stocks was measured for each of the past four quarters:

$$\textit{Profitability} = \frac{[\textit{Revenue}] - [\textit{COGS}]}{\textit{Assets}}$$

- Crude revenue and cost figures helped eliminate noise from stocks
- Momentum was calculated based on prior 6 months performance of stocks
- The intersection of the two defined the stock universe from which scripts were selected

EQUITY STRATEGY

Stocks were screened based on the following screening criteria

- Market cap restriction
 - Minimum of \$3 Bn.
 - Maximum of \$40 Bn.
- Profitability ranking was calculated by assigning higher weights to the profitability figure of the latest quarter

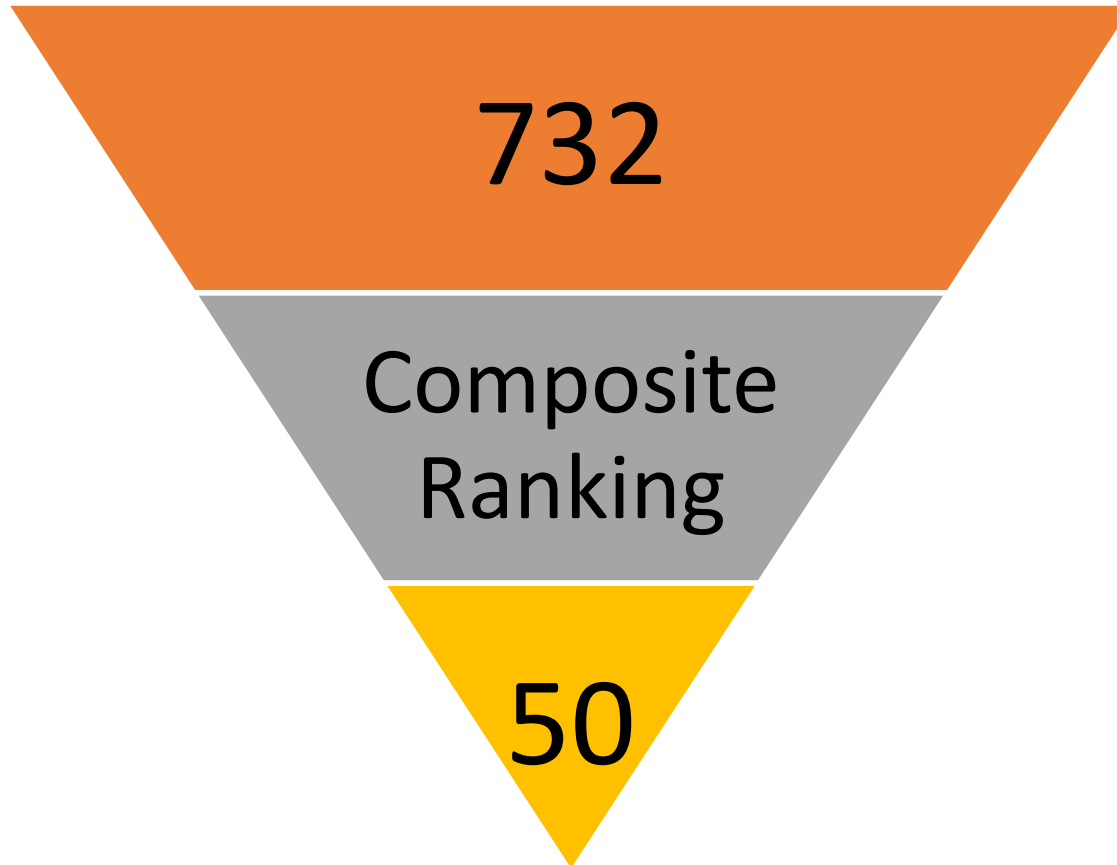
$$\textit{Profitability ranking} = 0.4xP_t + 0.2x[P_{t-1} + P_{t-2} + P_{t-3}]$$

- Momentum ranking was calculated by measuring return over a six month period
- A composite rank of profitability and momentum was assigned to each script

$$\textit{Composite Rank} = \frac{[\textit{Profitability Rank}] + [\textit{Momentum Rank}]}{2}$$

- The stocks were ranked based on the composite rank
- The top 50 stocks were selected from the composite ranking index

EQUITY STRATEGY



Screening criteria

- Market Cap. restriction
- Excluded Financial companies
- Avg. daily volume = 100K

Ranking on Profitability & Momentum

- Stocks ranked individually
- Composite ranking calculated for all the scripts

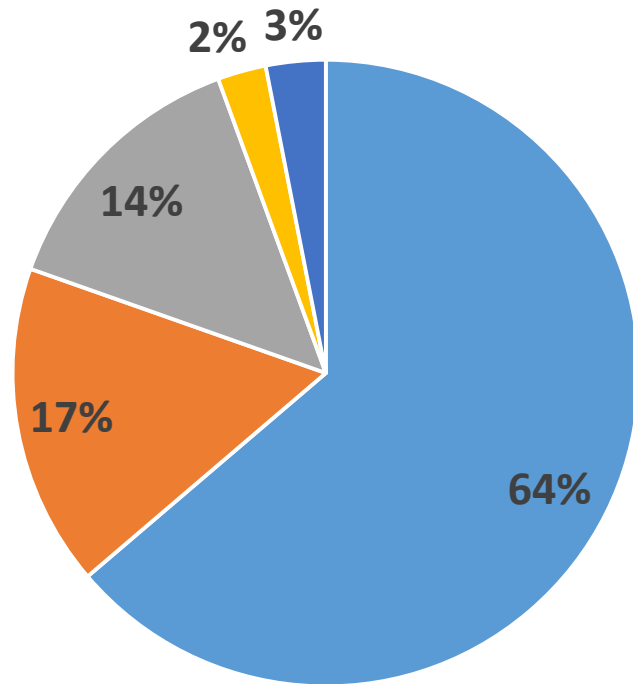
Selected top 50

- Met minimum requirement of 40 stocks
- Market cap weighted portfolio

EQUITY PORTFOLIO SNAPSHOT

SIMFUND Weights

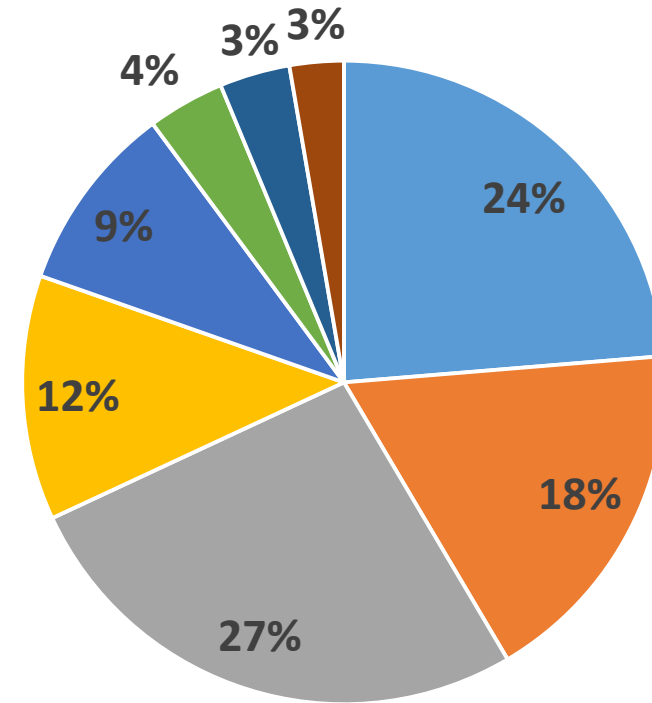
- Consumer Goods ■ Technology ■ Healthcare
- Materials ■ Industrials



As of 20th November

S&P 500 Index Weights

- Technology ■ Healthcare ■ Consumer Goods ■ Industrials
- Energy ■ Materials ■ Utilities ■ Telecom



Note: Financials excluded from S&P500 index

EQUITY PORTFOLIO SNAPSHOT

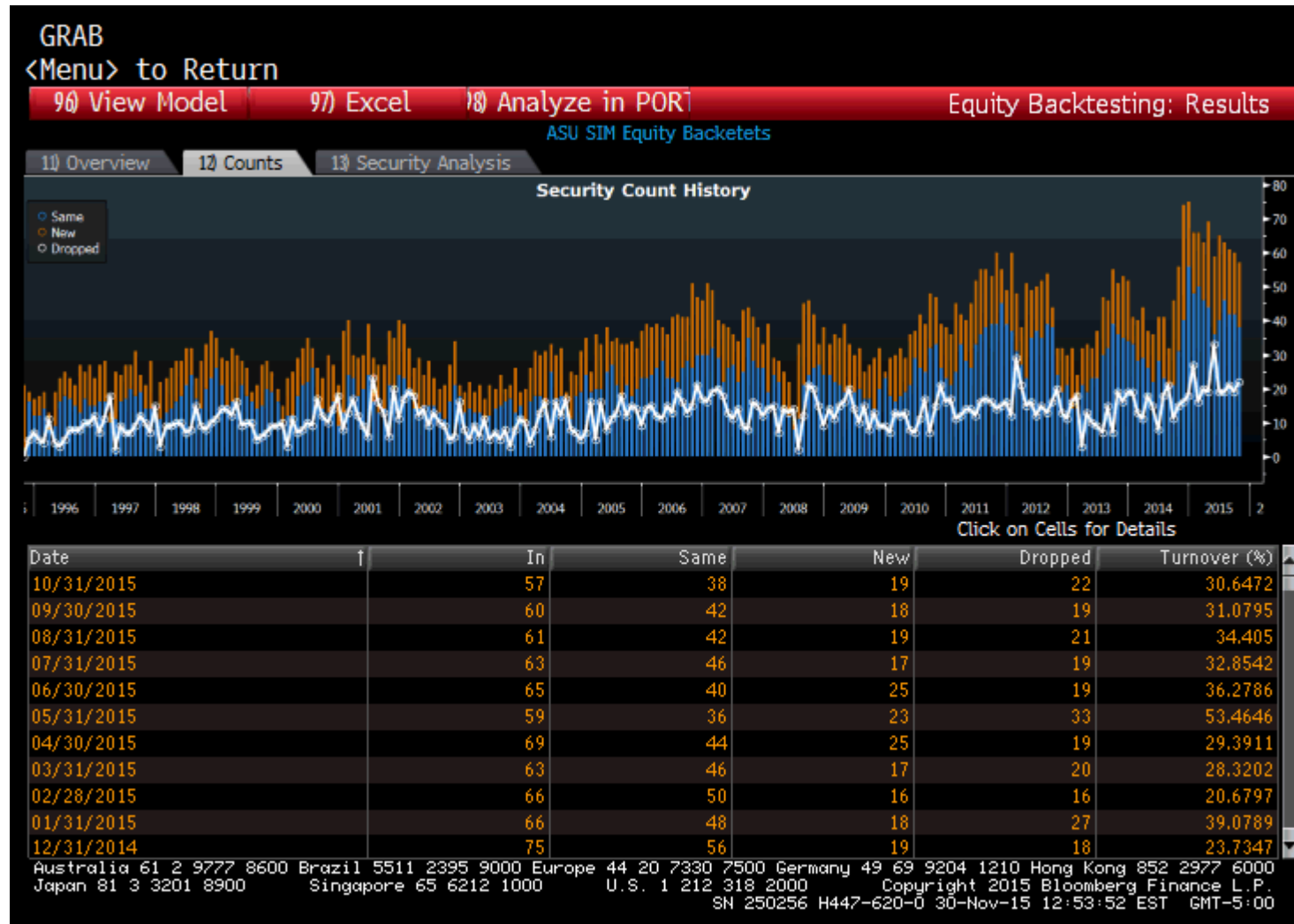
Name	Holding	Weight (%)
Kroger Co	44,024	5.0%
L Brands Inc	34,567	4.0%
O'Reilly Automotive Inc	32,291	3.8%
AutoZone Inc	28,669	3.3%
Brown-Forman Corporation	27,188	3.2%
Incyte Corporation	27,007	3.1%
Electronic Arts Inc	26,374	3.1%
Under Armour Inc	24,975	2.9%
Tractor Supply Company	23,683	2.8%

Market Cap weighted

- Max weight – 5%
- Min Weight – 0.4%

*Top 10 Holdings
As of 18th November*

REBALANCING & IMPLEMENTATION



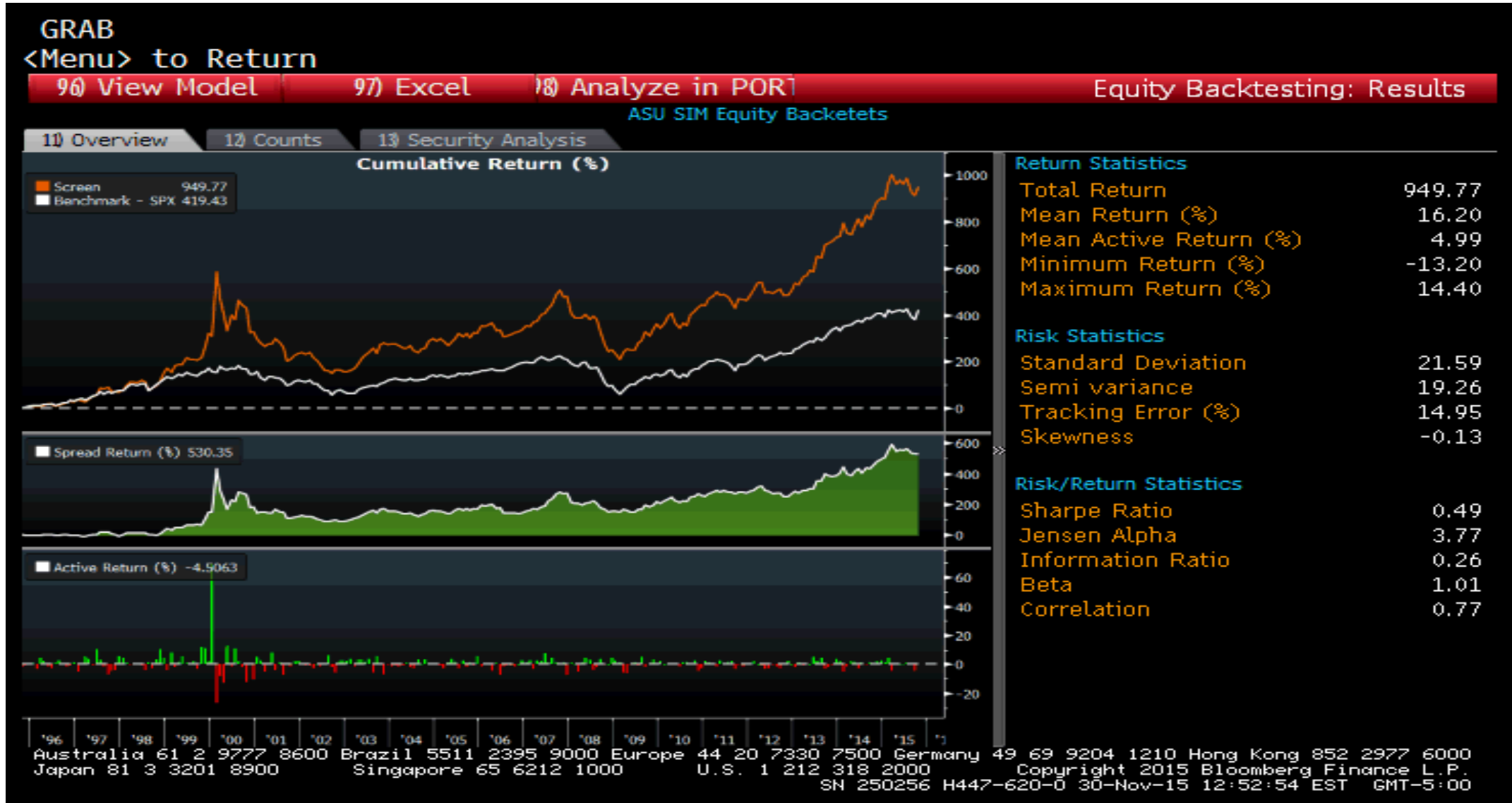
Rebalancing

- Monthly
- Hard stop on 50 stocks

Trading costs stem from price drifts during buying or selling

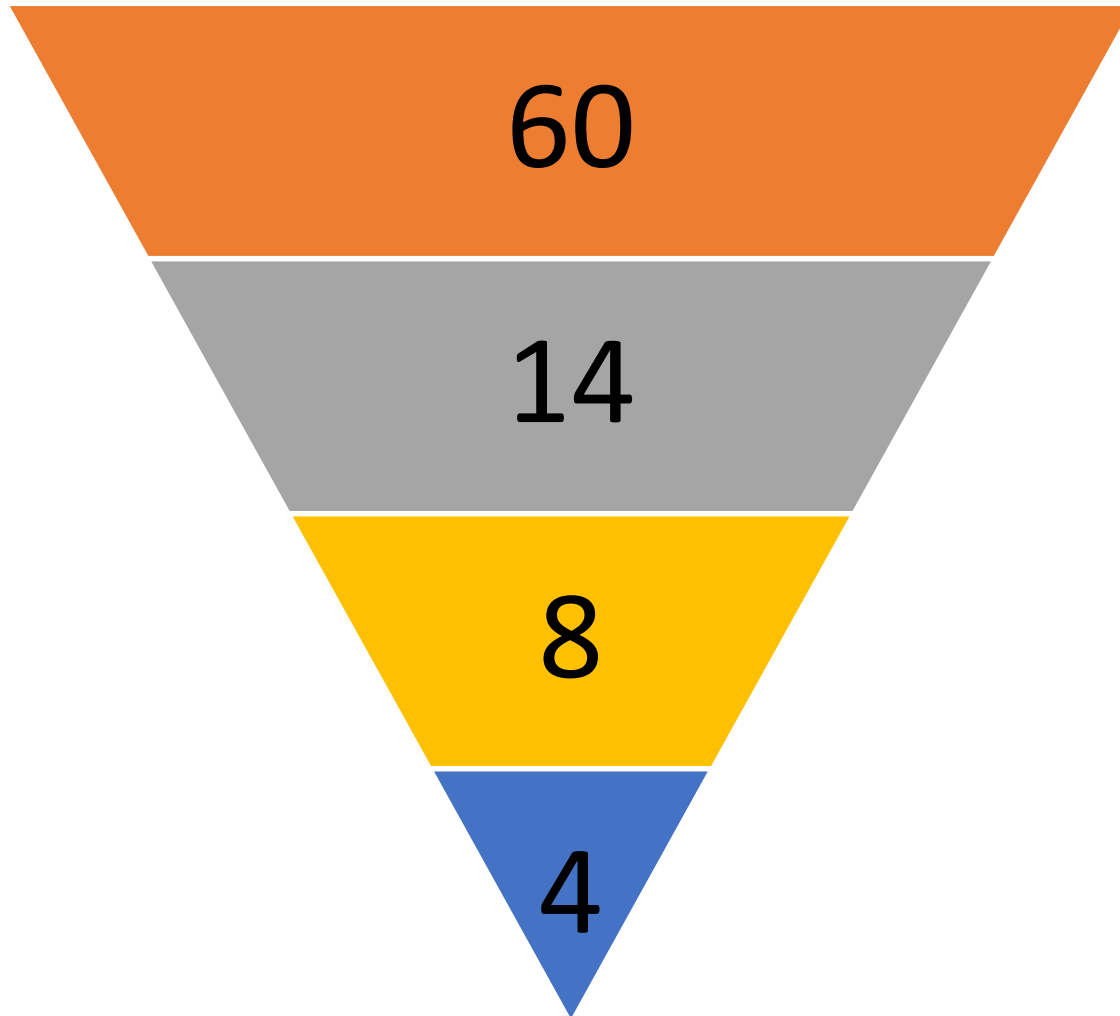
Market Cap weighting will reduce the effect of high turnover

PORTFOLIO BACKTEST



REITS

REIT STRATEGY



Screening criteria

- Market Cap. Restriction > \$1 Bn.
- Avg. daily volume = 100K
- Price > \$10

Fundamental Analysis

- 2 REITs selected per analyst
- One each from high P/E and low P/E ranking to ensure value and growth
- Diverse sectors selected for analysis

Cross validation

- Second round of screening was done to eliminate analysis bias

Selected 4 REITS

- Analysis indicated opportunities for short term returns

EXTRA SPACE STORAGE (EXR)

COMPANY DESCRIPTION

- **STORAGE REIT** – Owns more than 828 facilities in 35 states, concentrated in west coast and metros
- **Volatile Revenue Streams:** 92% occupancy, SEASONAL DEMAND, Dividend yield of 2.65% (Increasing)
- **Moderate Financial position:** D/A = 55%, D/E = 34%
- **LOT OF ROOM FOR CONSOLIDATION:** EXR has a market share of ~4% with 85% of market being controlled by non-REITs (Small and local property owners)



Share Price	83.7
Shares Out.	123.5
Market Capitalization	10,337
Total Enterprise Value	13,830
Revenue (2014)	647
EBITDA (2014)	394
FFO/Share (2014)	2.52
Cost of Capital	8.5%
Revenue (2016)	871
EBITDA (2016)	501
FFO/Share (2016)	3.87
Terminal growth	3%
Div Yield	2.65%

CMP
\$83.93

Target Price
\$95.83

CUBE SMART (CUBE)

COMPANY DESCRIPTION

- **STORAGE REIT** – Owns more than 420 facilities in 22 states, Manages 174 facilities for third parties, focus in east coast
- **Volatile Revenue Streams:** 89% occupancy, SEASONAL DEMAND, Div yield of 2.5% (Increasing)
- Operating Expense margin 55% ('10) – 41% ('15)
- **Moderate Financial position:** D/A = 36% (<1% Secured), D/E = 25%, BBB
- **LOT OF ROOM FOR CONSOLIDATION:** CUBE has a market share of ~2% with 85% of market being controlled by non-REITs (Small and



Share Price	29.2
Shares Out.	172.5
Market Capitalization	5,018
Total Enterprise Value	6,255
Revenue (2014)	377
EBITDA (2014)	220
FFO/Share (2014)	0.89
Cost of Capital	9%
Revenue (2016)	504
EBITDA (2016)	302
FFO/Share (2016)	1.41
Terminal growth	3%
Div Yield	2.5%

CMP
\$29.34

Target Price
\$33.95

SENIOR HOUSING TRUST (SNH)

COMPANY DESCRIPTION

- **Senior Housing & medical facility REIT** – 423 properties in 43 states
- Favorable demographics and expected strong future demand
- **Sustained high payout ratio** – Several years over 10% payout
- Consistent YoY & QoQ growth for three years
- Management emphasis on hedging interest rate risk



Share Price	14.55
Shares Out.	237.4M
Market Capitalization	3,470M
Total Enterprise Value	6,054M
Revenue (2014)	844M
EBITDA (2014)	544M
FFO/Share (2014)	1.75
Cost of Capital	12%
Revenue (2016)	981M
EBITDA (2016)	627M
FFO/Share (2016)	1.80
Dividend Yield	11%
Target Price	18.84

CMP
\$14.39

Target Price
\$18.84

ESSEX PROPERTY TRUST (ESS)

COMPANY DESCRIPTION

- **Apartment REIT** – Owns apartments and commercial buildings in west metropolitan areas including Los Angeles, San Francisco and Seattle.
 - Owns 239 communities, aggregating 57,455 units
- Demand growth
 - Increase in youth wealth, strict lending, 1.25 M permits (400k avg. scrap rate) – below est. demand of 1-1.5 M
- If supply does not react, then ESS achieves pricing power
- High sector growth rates



	Perpetuity Growth					
	\$ 291.62	3.4%	3.8%	4.0%	4.2%	4.6%
Discount Rate (WACC)	6.5%	349.29	406.74	442.36	484.17	594.21
	7.0%	288.85	329.82	354.40	382.49	452.72
	7.5%	243.20	273.74	291.62	311.67	360.08
	8.0%	207.51	231.04	244.58	259.53	294.73
	8.5%	178.84	197.47	208.02	219.55	246.17

	Terminal EBITDA Multiple					
	\$ 313.04	24.4x	25.9x	27.4x	28.9x	30.4x
Discount Rate (WACC)	6.5%	291.44	311.03	330.63	350.23	369.83
	7.0%	283.43	302.57	321.71	340.86	360.00
	7.5%	275.63	294.33	313.04	331.74	350.44
	8.0%	268.05	286.32	304.59	322.87	341.14
	8.5%	260.67	278.52	296.38	314.24	332.09

CMP
\$233.86

Target Price
\$291.62

OTHER REITS CONSIDERED

REIT	BACKGROUND	DECISION - JUSTIFICATION
National Retail Properties	Commercial/retail property	No- Poor company performance
Strategic Hotels	Hotels	No - Buying into a premium
Starwood Hotels	Hotels	No – Recent Acquisition
LaSalle Hotel	Hotels	No – Poor performance
Macerich Co.	Shopping Centers	No – Overvalued
Diamondrock Hospitality	Hotels/Resorts	No – Poor performance due to reduced demand
Retail Opportunity Investments	Shopping Centers	No – Too market specific
Omega Healthcare Investors	Medical Facilities	No – Too regional
Ventas	Medical Facilities	No – Subpar compared to other medical REITs
American Tower Corp.	Wireless/Cellular Towers	No – low payout, overvalued

FIXED INCOME

FIXED INCOME – BOND ETFS

Bond ETFs ~5% of the total portfolio - ~\$40,000

Investment Goal - Diversification

- Debt Securities
- Domestic and International

Investment Strategy

1. Narrowed universe to 9 Bond EFTs based upon fee structure and yield
 - 8 Vanguard
 - 1 Invesco
2. Assigned score based upon credit grade composition (AAA, AA, etc.)
3. Used score, yield, maturity and domestic/international composition to select Bond ETF investments

FIXED INCOME – BOND ETFS

Security	Maturity	Yield	Fees	NAV (\$ Bn)	Weight
Int Term Bond (BIV)	7.2	3.85%	0.10%	21.6	49.9%
Int Term Govt Bond	5.6	2.50%	0.12%	1.0	
MBS (VMBS)	6.2	2.97%	0.12%	2.0	
Sht Term Bond	2.8	1.48%	0.10%	41.9	
Sht Term Govt Bond	1.9	0.68%	0.12%	1.0	
Sht Term TIPS	2.6	-0.70%	0.10%	12.3	
Tot Bond	7.9	2.97%	0.07%	147.0	
Tot Int Bond (BNDX)	8.9	3.08%	0.19%	48.3	50.1%
EM Sov Debt (PCY)	13.5	5.96%	0.50%	2.7	
Portfolio	8.1	3.46%	0.15%		

All ETFs except for PCY are from Vanguard, PCY offered by Invesco
 Similar Bond ETFs from Fidelity, Blackrock and Invesco had slightly higher fees

Investment Charter: Weighted Average greater than AA, Maturity less than 10 years

NEXT STEPS

- Equity: Rebalancing
 - Momentum: Monthly
 - Profitability: Quarterly
- REITs: Monitor closely on each REIT fundamentals
- Attribution

Thank You

Backup - Momentum

Sector SPDR Fund	% Change
S&P 500 Index	+2.12%
Consumer Discretionary (XLY)	+13.11%
Consumer Staples (XLP)	+2.78%
Energy (XLE)	-13.39%
Financial Services (XLFS)	+0.00%
Financials (XLF)	+0.40%
Health Care (XLV)	+5.75%
Industrials (XLI)	-2.79%
Materials (XLB)	-5.21%
Real Estate (XLRE)	+0.00%
Technology (XLK)	+7.26%
Utilities (XLU)	-8.60%