

## PERSPECTIVES THAT DRIVE ENTERPRISE SUCCESS

**PERIOD ENDING: September 30, 2017** Investment Performance Monthly Review for

**Merced County Employees' Retirement Association** 

# 3<sup>rd</sup> quarter summary

## THE ECONOMIC CLIMATE

- Growth strengthened across developed and emerging economies. Business surveys suggest conditions are improving in both manufacturing and service industries.
- The U.S. job market tightened as unemployment dropped from 4.4 to 4.2%, despite disappointing job growth data. Unemployment has not been this low since March of 2001.
- An independence movement in Catalonia has received little attention from the financial community, and risk premiums may not reflect the negative possible knock-on effects on the EU.

## PORTFOLIO IMPACTS

- Improving economic growth, low inflation, low unemployment, and supportive monetary policy across most markets has created a positive environment for global risk assets, justifying a moderate overweight risk position.
- Within risk assets, we believe opportunities exist in emerging markets.

## THE INVESTMENT CLIMATE

- Global interest rates are still at historic lows, and very little monetary tightening is priced in across developed markets over the next few years. Even in the U.S., the market is only expecting two rate hikes through the end of next year.
- Valuations across global equities and credit are elevated, and have been so for the past few years.
   Further price appreciation through equity multiple expansion or credit spread contraction is unlikely.

## ASSET ALLOCATION ISSUES

- Equity performance remains strong. Year-to-date returns have been fundamentally driven, supported by earnings growth rather than valuation expansion.
- Equity volatility is near historic lows. Stable economic growth and inflation have likely contributed to the muted volatility environment. Investors should monitor leverage in strategies with a specific volatility target.

We believe a moderate overweight to risk is warranted



## U.S. economics summary

- U.S. real GDP grew 2.2% YoY in Q2, consistent with the trend of slow, but steady growth in the current expansion. Consumer spending and business investment were the primary drivers of growth.
- Purchasing manager indexes (PMIs) moved higher to above average levels, indicating a likely acceleration in economic growth over the coming quarters. The ISM Manufacturing and Services PMIs for September were 60.8 and 59.8, respectively.
- The economy added an average of 91,000 jobs per month to payrolls in the third quarter. The September employment data was heavily influenced by hurricanes Harvey and Irma, which resulted in a decline of 33,000 jobs from payrolls, the first drop since 2010. Due to the calculation methodology, a bounce back should be expected in October.

- The U3 unemployment rate (unaffected by the hurricanes) fell
   0.2% to a 17-year low of 4.2% over the quarter. The broader U6 unemployment rate also tightened, dropping 0.3% to 8.3%.
- Year-over-year headline CPI accelerated from 1.6% in June to 2.2% in September, while the core inflation rate was unchanged over the quarter at 1.7%. Outside of volatile energy prices inflationary pressures still appear absent, and core inflation remains below the Fed's 2% target.
- The Fed paused from raising interest rates following three consecutive quarters with hikes.
   Core inflation that has persistently been below the Fed's 2% target was the primary reason given to delay further tightening. The market is expecting the Fed to raise interest rates again in December based on fed fund futures prices.

	Most Recent	12 Months Prior
GDP (YoY)	<b>2.2%</b> 6/30/17	<b>1.2%</b> 6/30/16
Inflation (CPI YoY, Headline)	<b>2.2%</b> 9/30/17	1.5% 9/30/16
Expected Inflation (5yr-5yr forward)	2.0% 9/30/17	1.8% 9/30/16
Fed Funds Rate	<b>1.25%</b> 9/30/17	0.50% 9/30/16
10 Year Rate	<b>2.3%</b> 9/30/17	<b>1.6%</b> 9/30/16
U-3 Unemployment	<b>4.2%</b> 9/30/17	<b>4.9%</b> 9/30/16
U-6 Unemployment	8.3% 9/30/17	<b>9.7%</b> 9/30/16



## International economics summary

- International economic growth advanced in the second quarter in both developed and emerging markets. PMIs are above 50 (indicating expansion) in nearly every country across the world, pointing towards a continuation in the recent global growth pickup.
- The IMF raised its projections for global GDP growth 0.1% for both 2017 and 2018 to 3.6% and 3.7%, respectively. For comparison, global GDP growth was 3.2% in 2016.
- Economic conditions in emerging markets have improved. Several countries, such as Brazil and Russia, are still at the beginning stages of a recovery. Lower inflation has allowed emerging central banks to pursue looser monetary policy, which should provide a tailwind to further economic growth.

- Inflation in developed countries has yet to see much pressure outside of the U.K., and remains well below central bank targets.
- Inflation in the U.K. (headline CPI) rose 3.0% YoY in September, driven partly by a weaker pound, while wages only increased by 2.2%. The Bank of England stated that a rate hike may be necessary before the end of the year to slow price increases.
- On October 1<sup>st</sup>, Catalonia passed a referendum to declare independence from Spain, which the Spanish government declared illegal. Although the Catalan prime minister accepted the vote as a mandate to declare independence, he immediately suspended this declaration with the goal of bringing the Spanish government to the negotiating table.

Area	GDP (Real, YoY)	Inflation (CPI, YoY)	Unemployment
United States	<b>2.2%</b>	<b>2.2%</b>	<b>4.2%</b>
	6/30/17	9/30/17	9/30/17
Western	<b>2.0%</b>	1.5%	<b>7.9%</b>
Europe	6/30/17	9/30/17	6/30/17
Japan	<b>1.4%</b>	<b>0.7%</b>	<b>2.8%</b>
	6/30/17	8/31/17	8/31/17
BRICS	<b>5.6%</b>	<b>2.0%</b>	5.8%
Nations	6/30/17	6/30/17	6/30/17
Brazil	0.3%	<b>2.5%</b>	<b>12.7%</b>
	6/30/17	9/30/17	9/30/17
Russia	<b>2.5%</b>	<b>3.0%</b>	<b>4.9%</b>
	6/30/17	9/30/17	8/31/17
India	<b>5.7%</b>	<b>3.3%</b>	<b>8.4%</b>
	6/30/17	9/30/17	12/31/16
China	<b>6.9%</b>	1.6%	4.0%
	6/30/17	9/30/17	6/30/17



# Equity environment

- We maintain a moderate overweight to equities with a preference for emerging markets. Emerging markets have historically delivered outsized economic growth and performance during strong global growth environments. These markets remain attractively valued relative to developed markets, though valuations rose over the quarter.
- U.S. equities moved upward in Q3, setting record highs. Performance has been fueled by earnings growth.
- The possibility of U.S. corporate tax reform has led the market to price in greater expectations for future equity earnings growth. Significant uncertainty remains around the timing and nature of the reform, and the outcome will have a material impact on equity prices in the short-term.

- Equity volatility remains unusually low. Lower volatility has historically indicated less downside risk in equity markets.
- According to FactSet as of October 6th, the estimated Q3 earnings growth rate of the S&P 500 was 2.8% YoY, a materially weaker figure than the 7.5% which was expected as of June 30. Much of the weakness was caused by expected insurance industry losses due to hurricane damage. Excluding the insurance sector, earnings are expected to grow by 4.9% YoY.
- U.S. dollar weakness year-to-date has caused significant earnings differences between companies with greater international sales focus and companies that are more domestically-focused. Overall, U.S. dollar movement has acted as a tailwind to earnings growth.

**1 YEAR TOTAL** OTD TOTAL RETURN YTD TOTAL RETURN RETURN (unhedged) (hedged) (unhedged) (hedged) (unhedged) (hedged) US Large Cap 4.5% 14.2% 18.5% (Russell 1000) US Small Cap 5.7% 10.9% 20.7% (Russell 2000) US Large Value 3.1% 7.9% 15.1% (Russell 1000 Value) **US Large Growth** 20.7% 21.9% (Russell 1000 5.9% Growth) International Large 5.4% 3.7% 20.0% 12.3% 19.1% 20.5% (MSCI EAFE) Furozone 8.5% 5.2% 25.2% 13.2% 29.2% 24.9% (Euro Stoxx 50) U.K. 4.8% 2.1% 15.7% 7.2% 14.9% 11.9% (FTSE 100) Japan 2.0% 2.7% 12.1% 9.4% 13.4% 27.0% (NIKKEI 225) Emerging Markets 7.9% 27.8% 22.5% 19.6% 7.2% 22.1% (MSCI Emerging Markets)

Source: Russell Investments, MSCI, STOXX, FTSE, Nikkei, as of 9/30/17

# Domestic equity

U.S. equities moved upward over the quarter (S&P 500 +4.5%), reaching record highs, but underperformed international markets (MSCI EAFE +5.4%). Earnings growth remained the primary driver of robust equity performance, though Q3 earnings growth expectations have fallen due to hurricane-related insurance industry losses. The possibility of U.S. tax reform has likely contributed to a positive domestic equity outlook.

According to FactSet, as of October 6th the estimated Q3 earnings growth rate of the S&P 500 was 2.8% YoY, a

materially weaker figure than the 7.5% which was expected as of June 30. Most of the weakness was caused by insurance industry losses due to hurricane damage. Excluding this sector would result in a current estimate of 4.9% overall growth rather than 2.8%.

We maintain a neutral weight to U.S. equities

U.S. domestically-facing business in aggregate are expected to face flat sales and revenue growth, while externally-facing businesses are expected to produce strong growth. U.S. dollar depreciation and international growth have created a tailwind to the performance of externally-focused U.S. businesses.

### **U.S. EQUITIES**



### S&P 500 EPS GROWTH



### Q3 EXPECTATIONS



Source: FactSet, as of 10/6/17

Source: Russell Investments, as of 9/29/17

Source: Bloomberg, as of 9/30/17



## Domestic equity size and style

Large cap equities led small cap equities through July and August. However, small cap equities rallied in September (+6.2% in the month) and outperformed large cap equities over the quarter. The move in September was partially attributed to an increased focus on U.S. tax reform. If passed, tax cuts will likely provide a greater marginal benefit to smaller companies. Expectations of lower taxes and deregulation have contributed to small cap price appreciation that has outpaced earnings. The relative P/E ratio between large and small companies is at its highest level since the financial crisis. Large cap equities were led by the technology sector, from which the strongest contributors were semiconductor and internet software companies. The top three individual contributors were Apple, Facebook and Microsoft. Small cap equities were mainly driven by producer durables companies.

Growth outperformed value in Q3 due to a higher relative weighting to technology companies. Financial services, the most heavily weighted sector in value, returned a positive 5.0%, but still underperformed technology by 3.2%.

#### SMALL CAP VS LARGE CAP (YOY)



VALUE VS GROWTH (YOY)

Source: Russell Investments, as of 9/30/17



## U.S. LARGE VS. SMALL RELATIVE VALUATIONS



Source: Russell, Bloomberg, as of 9/30/17

Source: Russell Investments, as of 9/30/17



## International equity

International equities outperformed domestic equities during the third quarter. The MSCI ACWI ex U.S. returned 6.2% (+4.6% hedged) while the S&P 500 returned 4.5%. Consistent with the first half of 2017, emerging markets outperformed (MSCI EM +7.9% unhedged) both the EAFE Small Cap Index (+7.5%) and the broad EAFE Index (+5.4%).

Japanese equities were the largest contributors to the EAFE index in Q3, particularly companies within the industrials and consumer discretionary sectors. Despite the positive moves, Japanese equity valuations based on earnings and sales remain attractive relative to those in Europe and the United Kingdom.

MSCI EAFE valuations have remained relatively stable in 2017 as earnings and sales growth have kept pace with price appreciation.

Currency effects added a positive 1.7% to the unhedged MSCI EAFE in Q3 (+7.6% year-to-date), as the U.S. dollar fell for a third consecutive quarter against a trade weighted basket of currencies.

### **GLOBAL EQUITY PERFORMANCE**



## VALUATIONS



### **EFFECT OF CURRENCY (1 YEAR ROLLING)**



Source: Bloomberg, as of 9/30/17

Source: Bloomberg, as of 9/30/17

Source: MSCI, as of 9/30/17



# Emerging market equity

We maintain an overweight to emerging market equities, which have historically delivered outsized economic growth and performance during stronger global growth environments.

Emerging market equities have outperformed developed markets over the quarter (7.9% vs. 4.8%) and the past year (22.5% vs 18.2%), reversing an extended period of underperformance following the global financial crisis. Currency movement was a significant contributor to

emerging market underperformance during this time, and the recent reversal in currency trends has been additive to the outperformance of these markets.

Valuations have risen off of low levels, bolstering returns. These markets are no longer cheap relative to history though strong earnings growth and mean reversion of currencies could likely fuel further outsized equity gains. Accelerating global growth should have a positive effect on emerging economies

### EMERGING MARKET FX & RELATIVE PERFORMANCE (7YR CUMULATIVE)



EQUITY PERFORMANCE (3YR ROLLING)



#### Source: Standard & Poor's, MSCI, as of 9/30/17

#### FORWARD P/E RATIOS



Source: Bloomberg as of 9/30/17

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Source: MSCI, JP Morgan EM Currency Index, as of 9/30/17



## Interest rate environment

- After bottoming out to a postelection low of 2.04% on September 7<sup>th</sup> following increased tensions with North Korea, the U.S. 10-year rose to finish the quarter slightly higher at 2.33%.
- The Fed kept interest rates unchanged over the quarter, citing concerns over the lack of inflation. However, Fed officials have communicated that they believe recent low inflation is transitory. An additional rate hike in December appears likely based on market implied probabilities.
- The Fed will begin to reduce its balance sheet in October. The central bank's plan is to runoff \$6 billion of Treasuries and \$4 billion of mortgage-backed securities per month. This will be scaled up commensurately every 3 months to \$50 billion per month. At this pace it will take more than seven years to return the balance sheet to pre-crisis levels.

- U.K. sovereign yields experienced the biggest increase among developed countries after the Bank of England acknowledged that a rate hike may be necessary by the end of the year to slow inflation.
- Very little monetary tightening is priced into short-term developed market interest rates over the next few years. Although we expect central banks to be cautious, faster than expected increases in interest rates represents a potential risk.
- Our underweight position to both
  U.S. and developed sovereign
  rates (currency hedged) was
  unchanged over the quarter,
  primarily due to the low carry.
  However, Treasuries still play an
  important role in portfolios by
  offering equity risk diversification.

Area	Short Term (3M)	10 Year
United States	1.02%	2.33%
Germany	(0.70%)	0.46%
France	(0.59%)	0.74%
Spain	(0.45%)	1.60%
Italy	(0.39%)	2.11%
Greece	2.02%	5.66%
U.K.	0.28%	1.37%
Japan	(0.17%)	0.07%
Australia	1.71%	2.84%
China	3.04%	3.62%
Brazil	7.46%	9.77%
Russia	7.76%	7.66%

Source: Bloomberg, as of 9/30/17



## Yield environment



#### **GLOBAL GOVERNMENT YIELD CURVES**



#### **YIELD CURVE CHANGES OVER LAST FIVE YEARS**



#### IMPLIED CHANGES OVER NEXT YEAR



Source: Bloomberg, as of 9/30/17



## Currency

The U.S. dollar depreciated an additional 2.7% in Q3 against a trade weighted basket of developed currencies, which brought the year-to-date decline to 8.0%. The downward trend partially reversed in September after prospects of another interest rate hike in December from the Fed helped lead to the first month of dollar appreciation so far this year. The euro appreciated 3.4% against the dollar over the quarter, influenced by improving economic conditions and the possibility of ECB tightening monetary policy.

After several years of depreciation, emerging market

currencies have stabilized. Improved current account balances and economic growth conditions have provided a positive backdrop for these currencies moving forward. However, a quicker than expected rise in U.S. interest rates could represent a headwind to further appreciation.

Currency losses from unhedged exposure to developed international equities has begun to reverse due to recent dollar weakness, although currency exposure has still resulted in materially higher volatility.

#### U.S. DOLLAR TRADE WEIGHTED INDEX



#### **EFFECT OF CURRENCY (1-YEAR ROLLING)**



#### JPM EM CURRENCY INDEX



Source: Federal Reserve, as of 9/30/17

Source: MPI, as of 9/30/17

Source: JPMorgan, as of 9/30/17



## Total Fund Performance Summary (Gross of Fees)

	Market Value (\$)	<sup>3 Mo</sup> (%) F	Rank	1 Yr (%) F	Rank	3 Yrs (%) F	Rank	<sup>5 Yrs</sup> (%) F	Rank	7 Yrs (%) I	Rank	10 Yrs (%)	Rank	Return** (%)	Since***
Total Fund - Gross <sup>*</sup>	777,544,331	4.1	9	12.8	35	7.3	27	9.0	32	8.9	33	5.0	65	8.3	Dec-94
Policy Index <sup>1</sup>		3.9	15	13.8	11	7.6	14	9.1	26	9.2	19	5.6	42	6.0	Dec-94
InvestorForce Public DB \$250mm-\$1B Gross Median		3.4		12.4		6.7		8.4		8.5		5.3		8.3	Dec-94
Total Fund w/o Alternatives - Gross	606,174,252	4.5	2	14.7	5	7.5	15	9.4	11						Dec-94
Policy Index w/o Al <sup>1</sup>		4.0	11	14.1	9	6.9	39	8.3	53						Dec-94
InvestorForce Public DB \$250mm-\$1B Gross Median		3.4		12.4		6.7		8.4		8.5		5.3		8.3	Dec-94
US Equity - Gross	241,883,997	5.1	21	19.9	20	12.4	4	15.9	3	14.9	8	7.9	29	10.0	Dec-94
80% R1000/ 20% R2000 <sup>1</sup>		4.7	37	19.1	40	11.0	32	14.2	48	14.2	38	7.5	51	9.9	Dec-94
InvestorForce All DB US Eq Gross Median		4.6		18.7		10.7		14.1		14.0		7.6		10.1	Dec-94
Mellon Dynamic US Equity - Gross	78,086,983	5.6	20	21.3	18	13.9	2							19.0	Dec-12
S&P 500		4.5	54	18.6	50	10.8	36	14.2	41	14.4	46	7.4	68	15.1	Dec-12
eA US Large Cap Core Equity Gross Median		4.6		18.6		10.3		13.9		14.3		7.9		14.8	Dec-12
Mellon Large Cap - Gross	120,483,373	4.5	55	18.6	53									17.0	Mar-16
Russell 1000		4.5	55	18.5	54	10.6	41	14.3	45	14.4	42	7.5	59	16.9	Mar-16
eA US Large Cap Equity Gross Median		4.6		18.8		10.2		14.0		14.1		7.8		16.7	Mar-16
DFA Small Cap - Gross	22,051,385	5.7	45	21.2	49	13.1	40							9.7	Jun-14
Russell 2000		5.7	46	20.7	52	12.2	54	13.8	68	13.5	73	7.8	75	8.6	Jun-14
eA US Small Cap Equity Gross Median		5.5		20.9		12.4		14.9		14.7		8.9		9.2	Jun-14
PanAgora - Gross	21,262,256	5.9	42	18.6	72	12.4	50							11.4	Sep-13
Russell 2000		5.7	46	20.7	52	12.2	54	13.8	68	13.5	73	7.8	75	10.1	Sep-13
eA US Small Cap Equity Gross Median		5.5		20.9		12.4		14.9		14.7		8.9		10.8	Sep-13

\* Managers are ranked against the eVestment Alliance (eA) style universes. Asset class composites are ranked against the InvestorForce universes. \*\* Since inception returns are based on the first full quarter of performance.

\*\*\* Since inception date denotes last day of the month.

- Effective 1/1/2017, only traditional asset class (public equity, public fixed income, REITs) investment management fees will be included in the gross of fee return calculation. 1 See Benchmark History.

Verus<sup>77</sup>

	Market Value (\$)	<sup>3 Mo</sup> (%) F	Rank	1 Yr (%) F	Rank	3 Yrs (%) F	Rank	5 Yrs (%) F	Rank	7 Yrs (%)	Rank	10 Yrs (%)	Rank	Return (%)	Since
International Equity - Gross	203,376,189	6.9	23	20.0	57	5.3	72	8.2	58	6.7	45	2.8	29	5.8	Dec-98
International Equity Custom <sup>1</sup>		6.3	49	21.3	31	5.5	66	8.2	59	6.3	57	1.5	68	4.6	Dec-98
InvestorForce All DB ex-US Eq Gross Median		6.2		20.3		6.1		8.4		6.6		2.1		6.0	Dec-98
Copper Rock - Gross	29,964,857	7.7	68	16.6	99	9.0	94							9.1	Sep-13
MSCI World ex US Small Cap GD		7.3	73	20.9	87	10.0	88	11.6	94	9.2	97			8.4	Sep-13
eA EAFE Small Cap Equity Gross Median		8.4		24.3		12.2		14.5		12.0		5.3		10.6	Sep-13
EARNEST Partners - Gross <sup>2</sup>	110,760														
Mellon International - Gross	113,168,767	5.4	69	19.5	60									16.4	Mar-16
MSCI EAFE Gross		5.5	67	19.7	59	5.5	74	8.9	70	6.9	78	1.8	80	16.6	Mar-16
eA All EAFE Equity Gross Median		6.0		20.5		7.0		10.0		8.2		3.1		17.1	Mar-16
Wells Capital - Gross	60,131,804	9.3	29	22.7	55	7.7	29	5.8	51					4.9	Mar-12
MSCI Emerging Markets Gross		8.0	45	22.9	52	5.3	65	4.4	80	2.9	77	1.7	80	3.7	Mar-12
eA Emg Mkts Equity Gross Median		7.8		23.1		6.3		5.8		4.1		2.8		5.1	Mar-12
US Fixed Income - Gross	160,914,065	0.9	66	2.1	37	3.3	55	3.0	54	4.2	48	3.9	86	5.6	Dec-94
US Fixed Custom <sup>1</sup>		0.9	70	1.5	44	3.2	59	2.4	69	3.2	73	4.5	73	5.8	Dec-94
InvestorForce All DB US Fix Inc Gross Median		1.1		1.2		3.5		3.1		4.1		5.2		6.2	Dec-94
Barrow Hanley - Gross	125,151,346	0.9	51	0.2	75	3.0	59	2.2	74	3.4	59			4.0	Mar-10
BBgBarc Aggregate		0.8	69	0.1	86	2.7	82	2.0	92	3.1	82			3.7	Mar-10
eA US Core Fixed Inc Gross Median		0.9		0.6		3.1		2.5		3.5		4.9		4.1	Mar-10
Guggenheim Loan - Gross	35,762,719	1.0	82	3.9	94	4.0	84							3.8	Aug-14
Credit Suisse Leveraged Loans		1.1	74	5.4	41	4.0	84	4.4	65	5.0	71	4.4	87	3.7	Aug-14
eA Float-Rate Bank Loan Gross Median		1.2		5.2		4.2		4.6		5.3		5.1		4.2	Aug-14

2 Liquidating as of 9/14/2016.

## Total Fund Performance Summary (Gross of Fees)

	Market Value (\$)	<sup>3 Mo</sup> (%)	Rank	1 Yr (%) F	Rank	3 Yrs (%)	Rank	5 Yrs (%) F	Rank	7 Yrs (%) F	Rank	10 Yrs (%)	Rank	Return (%)	Since
Hedge Fund - Net	22,938,208	2.7	24	12.0	6	4.2	21							3.9	Jun-14
Hedge Fund Custom <sup>1</sup>		2.3	33	6.4	56	3.2	35							3.0	Jun-14
InvestorForce All DB Hedge Funds Gross Median		1.8		6.9		2.6		4.9		4.4		2.7		2.4	Jun-14
OZ Domestic II - Net	16,887,578	2.5	41	14.5	19	6.2	37							5.9	Jun-14
eV Alt All Multi-Strategy Median		2.0		6.4		4.0		5.2		5.4		5.2		3.6	Jun-14
Graham Absolute Return - Net <sup>3</sup>	3,010,069													0.3	Aug-17
Wellington-Archipelago - Net 3	3,040,561													1.4	Aug-17
HFRI Fund of Funds Composite Index		2.3		6.5		2.2		3.8		2.9		1.1		0.4	Aug-17
Private Equity - Net	35,433,040	3.0	47	7.5	85	5.8	83	6.2	92	8.6	81	7.1	50	7.0	Jun-05
Thomson Reuters Cambridge Private Equity Index <sup>1</sup>		3.6	37	22.1	5	12.3	26	18.7	2	19.2	1	12.2	1	13.5	Jun-05
InvestorForce All DB Private Eq Net Median		2.9		12.6		9.1		10.5		10.3		7.1		9.2	Jun-05
Adams Street - Net	8,386,786	3.1		12.1		10.1		11.9		12.6		7.8		6.1	Sep-05
Invesco IV - Net	3,202,712	0.9		16.4		10.3		7.0		11.2		9.7		9.1	Jun-05
Invesco VI - Net	5,224,931	4.4		13.2		14.2								10.8	Jun-13
Ocean Avenue II - Net	6,631,921	1.2		12.2		5.2								3.0	Jun-14
Pantheon I - Net	1,604,374	4.4		10.2		3.3		5.8		7.2		5.0		3.3	Dec-05
Pantheon II - Net	3,882,970	6.3		15.2		9.9		12.5						10.9	Dec-11
Pantheon Secondary - Net	1,643,732	4.6		7.2		-0.2		0.7		2.3		2.2		3.2	Jun-07
Raven Asset Fund II - Net	4,855,614	1.8		-15.5		-7.1								-6.9	Aug-14
Real Assets - Net	104,594,794	2.5		5.9		7.9		8.0							Mar-99
Real Asset Custom <sup>1</sup>		3.9													Mar-99
SSgA - Net <sup>4</sup>	35,801,261	4.0												3.6	Apr-17
Real Asset Custom		3.9												5.6	Apr-17

3 Funded on 8/31/2017. 4 Funded on 4/3/2017.

	Market Value (\$)	<sup>3 Mo</sup> (%)	Rank	1 Yr (%) F	Rank	3 Yrs (%) F	Rank	5 Yrs (%)	Rank	7 Yrs (%)	Rank	10 Yrs (%)	Rank	Return (%)	Since
Real Estate - Net	55,478,821	1.7	52	5.1	81	7.8	94	8.0	95						Mar-99
NCREIF ODCE net <sup>1</sup>		1.6	54	6.7	57	10.1	60	10.7	65	11.2	69	6.2	15	8.8	Mar-99
InvestorForce All DB Real Estate Pub+Priv Gross Median		1.7		7.0		10.5		11.2		12.0		5.0		10.5	Mar-99
Greenfield Gap VII - Net	11,073,153	7.4		14.4										13.8	Dec-14
Patron Capital V - Net	2,777,483	0.0		8.7										0.3	Jan-16
UBS Trumbull Property - Net	41,628,185	0.2		3.3		7.5		8.3		9.2		3.9		7.4	Mar-99
NCREIF ODCE net		1.6		6.7		9.9		11.0		12.1		7.1		10.2	Mar-99
Infrastructure - Net	8,674,000	1.9		8.8										3.5	Dec-14
S&P Global Infrastructure <sup>1</sup>		3.1		20.3										10.7	Dec-14
KKR Global II - Net	4,687,689	0.0		12.0										9.5	Dec-14
North Haven Infrastructure II - Net	3,986,311	4.1		2.6										-0.6	May-15
S&P Global Infrastructure		3.1		20.3										12.0	May-15
Natural Resources - Net	4,640,712	0.6		14.9										22.8	Sep-15
S&P Global Natural Resources <sup>1</sup>		10.8		15.3										10.7	Sep-15
EnCap XI - Gross	84,500													0.0	Jul-17
GSO Energy Opportunities - Net	2,800,238	1.1		14.9										22.3	Nov-15
Taurus Mining - Net	1,373,219	0.0		11.4										23.0	Sep-15
Taurus Mining Annex - Net <sup>5</sup>	382,755	0.0												25.8	Jan-17
S&P Global Natural Resources		10.8		20.5		1.3		1.1		1.4				8.1	Jan-17
Cash - Gross	5,536,892	0.3		1.0		0.7		0.6		0.7		4.2		4.2	Sep-03
Treasury Cash - Gross	2,867,146														Sep-11

5 Funded on 1/31/2017.



	Market Value (\$)	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	7 Yrs (%)	10 Yrs (%)
Total Fund - Net	777,544,331	4.1	12.5	6.9	8.6		
Policy Index <sup>1</sup>		3.9	13.8	7.6	9.1		
Total Fund w/o Alternatives - Net	606,174,252	4.5	14.4	7.2	9.0		
Policy Index w/o Al <sup>1</sup>		4.0	14.1	6.9	8.3		
US Equity - Net	241,883,997	5.1	19.7	12.2	15.7		
80% R1000/ 20% R2000 <sup>1</sup>		4.7	19.1	11.0	14.2	14.2	7.5
Mellon Dynamic US Equity - Net	78,086,983	5.6	21.1	13.7			
S&P 500		4.5	18.6	10.8	14.2	14.4	7.4
Mellon Large Cap - Net	120,483,373	4.5	18.5				
Russell 1000		4.5	18.5	10.6	14.3	14.4	7.5
DFA Small Cap - Net	22,051,385	5.7	20.8	12.7			
Russell 2000		5.7	20.7	12.2	13.8	13.5	7.8
PanAgora - Net	21,262,256	5.7	17.6	11.7			
Russell 2000		5.7	20.7	12.2	13.8	13.5	7.8
International Equity - Net	203,376,189	6.8	19.5	4.7	7.5		
International Equity Custom <sup>1</sup>		6.3	21.3	5.5	8.2	6.3	1.5
Copper Rock - Net	29,964,857	7.5	15.7	8.1			
MSCI World ex US Small Cap GD		7.3	20.9	10.0	11.6	9.2	
EARNEST Partners - Net <sup>2</sup>	110,760						
Mellon International - Net	113,168,767	5.4	19.5				
MSCI EAFE Gross		5.5	19.7	5.5	8.9	6.9	1.8
Wells Capital - Net	60,131,804	9.1	21.5	6.7	4.8		
MSCI Emerging Markets Gross		8.0	22.9	5.3	4.4	2.9	1.7

1 See Benchmark History. 2 Liquidating as of 9/14/2016.



	Market Value (\$)	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	7 Yrs (%)	10 Yrs (%)
US Fixed Income - Net	160,914,065	0.9	1.9	3.2	2.8		
US Fixed Custom <sup>1</sup>		0.9	1.5	3.2	2.4	3.2	4.5
Barrow Hanley - Net	125,151,346	0.9	0.0	2.8	2.0		
BBgBarc Aggregate		0.8	0.1	2.7	2.0	3.1	
Guggenheim Loan - Net	35,762,719	1.0	3.9	4.0			
Credit Suisse Leveraged Loans		1.1	5.4	4.0	4.4	5.0	4.4
Hedge Fund - Net	22,938,208	2.7	12.0	4.2			
Hedge Fund Custom <sup>1</sup>		2.3	6.4	3.2			
OZ Domestic II - Net	16,887,578	2.5	14.5	6.2			
Graham Absolute Return - Net <sup>3</sup>	3,010,069						
Wellington-Archipelago - Net <sup>3</sup>	3,040,561						
HFRI Fund of Funds Composite Index		2.3	6.5	2.2	3.8	2.9	1.1
Private Equity - Net	35,433,040	3.0	7.5	5.8	6.2	8.6	7.1
Thomson Reuters Cambridge Private Equity Index <sup>1</sup>		3.6	22.1	12.3	18.7		
Adams Street - Net	8,386,786	3.1	12.1	10.1	11.9	12.6	7.8
Invesco IV - Net	3,202,712	0.9	16.4	10.3	7.0		
Invesco VI - Net	5,224,931	4.4	13.2	14.2			
Ocean Avenue II - Net	6,631,921	1.2	12.2	5.2			
Pantheon I - Net	1,604,374	4.4	10.2	3.3	5.8		
Pantheon II - Net	3,882,970	6.3	15.2	9.9	12.5		
Pantheon Secondary - Net	1,643,732	4.6	7.2	-0.2	0.7		
Raven Asset Fund II - Net	4,855,614	1.8	-15.5	-7.1			

3 Funded 8/31/2017.



	Market Value (\$)	3 Mo (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	7 Yrs (%)	10 Yrs (%)
Real Assets - Net	104,594,794	2.5	5.9	7.9	8.0		
Real Asset Custom <sup>1</sup>		3.9					
SSgA - Net <sup>4</sup>	35,801,261	4.0					
Real Asset Custom		3.9					
Real Estate - Net	55,478,821	1.7	5.1	7.8	8.0		
NCREIF ODCE net <sup>1</sup>		1.6	6.7	10.1	10.7	11.6	
Greenfield Gap VII - Net	11,073,153	7.4	14.4				
Patron Capital V - Net	2,777,483	0.0	8.7				
UBS Trumbull Property - Net	41,628,185	0.2	3.3	7.5	8.3		
NCREIF ODCE net		1.6	6.7	9.9	11.0	12.1	7.1
Infrastructure - Net	8,674,000	1.9	8.8				
S&P Global Infrastructure <sup>1</sup>		3.1	20.3				
KKR Global II - Net	4,687,689	0.0	12.0				
North Haven Infrastructure II - Net	3,986,311	4.1	2.6				
S&P Global Infrastructure		3.1	20.3				
Natural Resources - Net	4,640,712	0.6	14.9				
S&P Global Natural Resources <sup>1</sup>		10.8	15.3				
EnCap XI - Net	84,500						
GSO Energy Opportunities - Net	2,800,238	1.1	14.9				
Taurus Mining - Net	1,373,219	0.0	11.4				
Taurus Mining Annex - Net <sup>5</sup>	382,755	0.0					
S&P Global Natural Resources		10.8	20.5	1.3	1.1	1.4	
Cash - Net	5,536,892	0.3	1.0	0.7	0.6		
Treasury Cash - Net	2,867,146						

4 Funded on 4/03/2017. 5 Funded on 1/31/2017.

Verus<sup>777</sup>

## Total Fund Asset Allocation Analysis



	Current	%
US Equity	\$241,883,997	31.1%
International Equity	\$143,244,385	18.4%
Emerging Market Equity	\$60,131,804	7.7%
US Fixed Income	\$125,151,346	16.1%
Bank Loan	\$35,762,719	4.6%
Hedge Fund	\$22,938,208	3.0%
Real Estate	\$55,478,821	7.1%
Private Equity	\$35,433,040	4.6%
Real Assets	\$49,115,973	6.3%
Cash	\$8,404,038	1.1%
Total	\$777,544,331	100.0%

Bank Loan US Fixed Income 5.0 % 17.0 % Hedge Fund 5.0 % Emerging Market... Real Estate 7.0 % 8.0 % Private Equity International Equity 9.0 % 16.0 % **Real Assets** 6.0 % US Equity 27.0 %

Target

	Current	Policy	Difference
US Equity	31.1%	27.0%	4.1%
International Equity	18.4%	16.0%	2.4%
Emerging Market Equity	7.7%	7.0%	0.7%
US Fixed Income	16.1%	17.0%	-0.9%
Bank Loan	4.6%	5.0%	-0.4%
Hedge Fund	3.0%	5.0%	-2.0%
Real Estate	7.1%	8.0%	-0.9%
Private Equity	4.6%	9.0%	-4.4%
Real Assets	6.3%	6.0%	0.3%
Cash	1.1%		1.1%
Total	100.0%	100.0%	



## Total Fund Manager Allocation Analysis



	Actual	Actual
Adams Street	\$8,386,786	1.1%
Barrow Hanley	\$125,151,346	16.1%
Cash	\$5,536,892	0.7%
Copper Rock	\$29,964,857	3.9%
DFA Small Cap	\$22,051,385	2.8%
EARNEST Partners	\$110,760	0.0%
EnCap XI	\$84,500	0.0%
Graham Absolute Return	\$3,010,069	0.4%
Greenfield Gap VII	\$11,073,153	1.4%
GSO Energy Opportunities	\$2,800,238	0.4%
Guggenheim Loan	\$35,762,719	4.6%
Invesco IV	\$3,202,712	0.4%
Invesco VI	\$5,224,931	0.7%
KKR Global II	\$4,687,689	0.6%
Mellon Dynamic US Equity	\$78,086,983	10.0%
Mellon International	\$113,168,767	14.6%
Mellon Large Cap	\$120,483,373	15.5%
North Haven Infrastructure II	\$3,986,311	0.5%
Ocean Avenue II	\$6,631,921	0.9%
OZ Domestic II	\$16,887,578	2.2%
PanAgora	\$21,262,256	2.7%
Pantheon I	\$1,604,374	0.2%
Pantheon II	\$3,882,970	0.5%
Pantheon Secondary	\$1,643,732	0.2%
Patron Capital V	\$2,777,483	0.4%
Raven Asset Fund II	\$4,855,614	0.6%
SSgA	\$35,801,261	4.6%
Taurus Mining	\$1,373,219	0.2%
Taurus Mining Annex	\$382,755	0.0%
Treasury Cash	\$2,867,146	0.4%
UBS Trumbull Property	\$41,628,185	5.4%
Wellington-Archipelago	\$3,040,561	0.4%
Wells Capital	\$60,131,804	7.7%
Total	\$777,544,331	100.0%



## Period Ending: September 30, 2017

## Total Fund <u>Risk vs. Return (3 Years)</u>



- Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB \$250mm-\$1B Gross





- Policy Index
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce Public DB \$250mm-\$1B Gross





### InvestorForce Public DB \$250mm-\$1B Gross Accounts

	Return (Rank	x)										
5th Percentile	4.2		4.2		7.9		9.7		9.9		6.9	
25th Percentile	3.6		3.6		7.3		9.1		9.2		5.9	
Median	3.4		3.4		6.7		8.4		8.5		5.3	
75th Percentile	3.1		3.1		6.1		7.8		7.8		4.6	
95th Percentile	2.1		2.1		4.8		6.0		6.0		3.8	
# of Portfolios	57		57		56		55		53		48	
Total Fund	4.1	(9)	4.1	(9)	7.3	(27)	9.0	(32)	8.9	(33)	5.0	(65)
Policy Index	3.9	(15)	3.9	(15)	7.6	(14)	9.1	(26)	9.2	(19)	5.6	(42)





		Attributio	on Summary				
	Wtd. Actual Return	Wtd. Index Return	Excess Return	Selection Effect	Allocation Effect	Interaction Effects	Total Effects
US Equity	5.08%	4.71%	0.37%	0.10%	0.03%	0.02%	0.15%
International Equity	6.88%	6.27%	0.61%	0.14%	0.07%	0.02%	0.22%
US Fixed Income	0.93%	0.90%	0.03%	0.01%	0.01%	0.00%	0.02%
Hedge Fund	2.73%	2.31%	0.42%	0.02%	0.04%	-0.01%	0.05%
Private Equity	3.03%	3.56%	-0.53%	-0.05%	0.01%	0.02%	-0.01%
Real Assets	2.52%	3.90%	-1.38%	-0.19%	0.00%	-0.01%	-0.20%
Total	4.12%	3.89%	0.23%	0.03%	0.17%	0.04%	0.23%



## US Equity Manager Allocation Analysis



Total	\$241,883,997	100.0%
PanAgora	\$21,262,256	8.8%
Mellon Large Cap	\$120,483,373	49.8%
Mellon Dynamic US Equity	\$78,086,983	32.3%
DFA Small Cap	\$22,051,385	9.1%
	Actual	Actual



## US Equity Risk vs. Return (3 Years)

Anlzd

Standard

Deviation

Rank

1

1

---

Sharpe

Ratio

1.6

1.4

1.0

Sharpe

Ratio

Rank

1

1

---

Anlzd

Return

Rank

4

32

--

Anlzd

Return

12.4%

11.0%

10.7%

Anlzd

Standard

Deviation

7.7%

7.7%

10.3%



- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce All DB US Eq Gross

## US Equity Risk vs. Return (5 Years)

Verus<sup>777</sup>

Anlzd

Standard

Deviation

Rank

1

1

---

Sharpe

Ratio

1.9

1.7

1.4

Sharpe

Ratio

Rank

1

1

---

Anlzd

8.1%

8.2%

10.0%







InvestorForce All DB US Eq Gross Accounts



5th Percentile

# of Portfolios

• US Equity

Median

Charac	teristics	
	Portfolio	Russell 3000
Number of Holdings	2,832	2,981
Weighted Avg. Market Cap. (\$B)	126.3	135.9
Median Market Cap. (\$B)	2.3	1.6
Price To Earnings	25.3	25.1
Price To Book	5.0	4.4
Price To Sales	3.5	3.6
Return on Equity (%)	19.6	17.2
Yield (%)	1.8	1.8
Beta (holdings; domestic)	1.1	1.0

Top Holdings					
APPLE	2.9%				
MICROSOFT	2.0%				
FACEBOOK CLASS A	1.4%				
AMAZON.COM	1.4%				
BERKSHIRE HATHAWAY 'B'	1.3%				
JOHNSON & JOHNSON	1.3%				
EXXON MOBIL	1.2%				
JP MORGAN CHASE & CO.	1.2%				
ALPHABET 'C'	1.2%				
BANK OF AMERICA	0.9%				

### **Best Performers**

	Return %
MYOKARDIA	227.1%
MIRATI THERAPEUTICS(NAS)	220.5%
ABEONA THERAPEUTICS	166.4%
ZOGENIX	141.7%
VOYAGER THERAPEUTICS	129.8%
DYNAVAX TECHNOLOGIES (DVAX)	122.8%
ION GEOPHYSICAL (IO)	118.6%
VERASTEM (VSTM)	115.6%
CELADON GROUP	114.3%
SKYLINE	100.8%

### Worst Performers

	Return %
VERSAR	-90.3%
PACIFIC DRILLING (PACDF)	-85.5%
OTONOMY (OTIC)	-82.8%
BABCOCK & WILCOX ENTS. (BW)	-71.7%
RESHAPE LIFESCIENCES (RSLS)	-64.6%
RADISYS (RSYS)	-63.6%
BLACK BOX	-62.0%
CHEROKEE (CHKE)	-60.4%
SURGERY PARTNERS	-54.5%
WINDSTREAM HOLDINGS	-54.4%



			Attribution Effects	5	Re	eturns	Secto	r Weights
	Total	Selection	Allocation	Interaction				-
	Effects	Effect	Effect	Effects	Portfolio	Benchmark	Portfolio	Benchmark
Energy	0.0%	0.0%	0.0%	0.0%	7.0%	6.8%	5.6%	5.7%
Materials	0.0%	0.0%	0.0%	0.0%	5.0%	5.3%	2.8%	2.8%
Industrials	0.0%	0.0%	0.0%	0.0%	4.7%	5.1%	11.0%	10.9%
Consumer Discretionary	0.0%	0.0%	0.0%	0.0%	1.4%	1.3%	11.7%	12.7%
Consumer Staples	0.0%	0.0%	0.0%	0.0%	-1.3%	-1.2%	7.9%	7.8%
Health Care	0.1%	0.1%	0.0%	0.0%	4.1%	3.7%	14.6%	14.1%
Financials	0.0%	0.0%	0.0%	0.0%	5.3%	5.2%	15.6%	15.1%
Information Technology	0.0%	0.0%	0.0%	0.0%	8.2%	8.4%	21.9%	21.7%
Telecommunication Services	0.0%	0.0%	0.0%	0.0%	7.5%	6.3%	2.0%	2.0%
Utilities	0.0%	0.0%	0.0%	0.0%	3.0%	3.1%	3.1%	3.2%
Real Estate	0.0%	0.0%	0.0%	0.0%	0.9%	1.1%	3.7%	4.1%
Cash	0.0%						0.0%	0.0%
Portfolio	0.1%	= 0.0%	+ 0.0%	+ 0.0%	4.6%	4.5%	100.0%	100.0%

## US Equity Performance Attribution ve. Puscell 3000











### eA US Large Cap Core Equity Gross Accounts

	Return (Ran	k)										
5th Percentile	6.4		6.4		13.0		16.5		15.9		9.8	
25th Percentile	5.4		5.4		11.2		14.9		14.9		8.4	
Median	4.6		4.6		10.3		13.9		14.3		7.9	
75th Percentile	3.7		3.7		9.1		13.0		13.3		7.1	
95th Percentile	2.6		2.6		7.0		11.0		11.6		6.3	
# of Portfolios	320		320		311		285		259		231	
<ul> <li>Mellon Dynamic US Equity</li> </ul>	5.6	(20)	5.6	(20)	13.9	(2)		<mark>()</mark>		()		()
▲ S&P 500	4.5	(54)	4.5	(54)	10.8	(36)	14.2	(41)	14.4	(46)	7.4	(68)

Number of Holdings Weighted Avg. Market Cap. (\$B)	Portfolio	000 500
Weighted Avg. Market Cap. (\$B)		S&P 500
	500	505
	162.5	163.1
Median Market Cap. (\$B)	20.6	20.7
Price To Earnings	25.2	24.6
Price To Book	5.3	4.8
Price To Sales	3.7	3.4
Return on Equity (%)	21.1	20.0
Yield (%)	2.0	2.0
Beta (holdings; domestic)	1.0	1.0

## **Top Holdings**

3.7%
2.7%
2.7%
1.9%
1.8%
1.6%
1.6%
1.6%
1.6%
1.1%

## **Best Performers**

	Return %
NRG ENERGY (NRG)	48.8%
GAP (GPS)	34.3%
MICHAEL KORS HOLDINGS (KORS)	32.0%
MICRON TECHNOLOGY (MU)	31.7%
LAM RESEARCH	31.2%
TRANSOCEAN (RIG)	30.7%
ALBEMARLE	29.5%
BOEING (BA)	29.3%
CF INDUSTRIES HDG.	27.0%
APPLIED MATS. (AMAT)	26.4%

## Worst Performers

	Return %
ENVISION HEALTHCARE (EVHC)	-28.3%
FOOT LOCKER	-28.1%
MATTEL	-27.4%
SCANA	-26.9%
CHIPOTLE MEXN.GRILL (CMG)	-26.0%
UNDER ARMOUR 'A'	-24.3%
EQUIFAX	-22.7%
BED BATH & BEYOND (BBBY)	-22.4%
L BRANDS	-21.6%
ULTA BEAUTY (ULTA)	-21.3%





### eA US Large Cap Equity Gross Accounts

	Return (Rank)										
5th Percentile	7.1	7.1		13.9		16.8		16.6		10.1	
25th Percentile	5.5	5.5		11.6		15.1		15.0		8.8	
Median	4.6	4.6		10.2		14.0		14.1		7.8	
75th Percentile	3.7	3.7		8.7		12.9		13.0		6.9	
95th Percentile	2.2	2.2		6.0		11.0		11.3		5.5	
# of Portfolios	928	928		909		854		795		713	
Mellon Large Cap	4.5 (	55) 4.5	(55)		()		()		()		()
Russell 1000	4.5 (	55) 4.5	<b>(</b> 55)	10.6	(41)	14.3	(45)	14.4	(42)	7.5	(59)

Verus<sup>777</sup>

Characteristics		
	Portfolio	Russell 1000
Number of Holdings	957	981
Weighted Avg. Market Cap. (\$B)	147.8	147.2
Median Market Cap. (\$B)	9.4	9.4
Price To Earnings	25.6	25.1
Price To Book	5.4	4.7
Price To Sales	3.7	3.6
Return on Equity (%)	20.5	18.6
Yield (%)	1.9	1.9
Beta (holdings; domestic)	1.0	1.0

### Top Holdings

APPLE	3.4%
ALPHABET 'C'	2.4%
MICROSOFT	2.3%
FACEBOOK CLASS A	1.7%
AMAZON.COM	1.6%
BERKSHIRE HATHAWAY 'B'	1.5%
JOHNSON & JOHNSON	1.5%
EXXON MOBIL	1.5%
JP MORGAN CHASE & CO.	1.4%
BANK OF AMERICA	1.0%

## Best Performers

	Return %
JUNO THERAPEUTICS (JUNO)	50.1%
NRG ENERGY (NRG)	48.8%
ALNYLAM PHARMACEUTICALS	47.3%
ALCOA	42.8%
TAKE TWO INTACT.SFTW. (TTWO)	39.3%
ORBITAL ATK	35.8%
INTERNATIONAL GAME TECH.	35.5%
ACADIA PHARMACEUTICALS	35.1%
SPIRIT AEROSYSTEMS CL.A	34.3%
GAP (GPS)	34.3%

### Worst Performers

	Return %
INTERCEPT PHARMS.	-52.1%
UNITI GROUP (UNIT)	-39.3%
TAHOE RESOURCES	-38.8%
SPIRIT AIRLINES (SAVE)	-35.3%
RITE AID (RAD)	-33.6%
DEXCOM (DXCM)	-33.1%
DICK'S SPORTING GOODS	-31.8%
MEDNAX	-28.6%
ENVISION HEALTHCARE (EVHC)	-28.3%
FOOT LOCKER	-28.1%


# Mellon Large Cap Equity Sector Attribution

			Attribution Effects		Retur	ns	Sector W	leights
	Total	Selection	Allocation	Interaction				
	Effects	Effect	Effect	Effects	Portfolio	Benchmark	Portfolio	Benchmark
Energy	0.0%	0.0%	0.0%	0.0%	6.8%	6.8%	5.9%	5.8%
Materials	0.0%	0.0%	0.0%	0.0%	5.1%	5.1%	2.7%	2.7%
Industrials	0.0%	0.0%	0.0%	0.0%	4.7%	4.7%	10.6%	10.6%
Consumer Discretionary	0.0%	0.0%	0.0%	0.0%	1.3%	1.2%	12.0%	12.7%
Consumer Staples	0.0%	0.0%	0.0%	0.0%	-1.5%	-1.4%	8.2%	8.2%
Health Care	0.0%	0.0%	0.0%	0.0%	3.4%	3.4%	14.2%	14.1%
Financials	0.0%	0.0%	0.0%	0.0%	5.1%	5.2%	15.1%	14.8%
Information Technology	0.0%	0.0%	0.0%	0.0%	8.6%	8.6%	22.2%	22.0%
Telecommunication Services	0.0%	0.0%	0.0%	0.0%	6.5%	6.5%	2.1%	2.1%
Utilities	0.0%	0.0%	0.0%	0.0%	2.9%	2.9%	3.2%	3.2%
Real Estate	0.0%	0.0%	0.0%	0.0%	1.0%	1.0%	3.8%	3.8%
Cash	0.0%						0.0%	0.0%
Portfolio	0.0%	= 0.0%	+ 0.0%	+ 0.0%	4.5%	4.5%	100.0%	100.0%

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### eA US Small Cap Equity Gross Accounts

	Return (Rar	ık)										
5th Percentile	9.4		9.4		16.9		18.2		17.8		11.9	
25th Percentile	6.7		6.7		14.1		16.2		16.0		10.0	
Median	5.5		5.5		12.4		14.9		14.7		8.9	
75th Percentile	4.3		4.3		10.3		13.3		13.4		7.8	
95th Percentile	1.8		1.8		5.3		9.9		10.9		5.9	
# of Portfolios	560		560		540		517		487		424	
DFA Small Cap	5.7	(45)	5.7	(45)	13.1	(40)		()		()		()
Russell 2000	5.7	(46)	5.7	(46)	12.2	(54)	13.8	(68)	13.5	(73)	7.8	(75)

Characte	eristics	
	Portfolio	Russell 2000
Number of Holdings	1,887	2,000
Weighted Avg. Market Cap. (\$B)	2.1	2.2
Median Market Cap. (\$B)	0.7	0.8
Price To Earnings	26.4	24.6
Price To Book	3.2	3.2
Price To Sales	2.3	3.0
Return on Equity (%)	13.3	10.4
Yield (%)	1.2	1.1
Beta (holdings; domestic)	1.2	1.3

#### **Top Holdings**

NATIONAL BEVERAGE	0.4%
SEABOARD	0.3%
KNIGHT-SWIFT TRSP.HDG. 'A'	0.3%
CANTEL MED.	0.3%
GRAND CANYON EDUCATION	0.3%
MKS INSTRUMENTS	0.3%
BRINK'S	0.3%
WGL HOLDINGS	0.3%
PRIMERICA	0.3%
MARRIOTT VACATIONS WWD.	0.3%

Best Performers					
	Return %				
MYOKARDIA (MYOK)	227.1%				
MIRATI THERAPEUTICS(NAS)	220.5%				
ABEONA THERAPEUTICS	166.4%				
ZOGENIX (ZGNX)	141.7%				
VOYAGER THERAPEUTICS (VYGR)	129.8%				
ION GEOPHYSICAL	118.6%				
VERASTEM	115.6%				
CELADON GROUP (CGI)	114.3%				
SKYLINE (SKY)	100.8%				
MASTECH DIGITAL (MHH)	97.2%				

#### **Worst Performers**

	Return %
VERSAR	-90.3%
PACIFIC DRILLING (PACDF)	-85.5%
OTONOMY	-82.8%
BABCOCK & WILCOX ENTS.	-71.7%
RESHAPE LIFESCIENCES	-64.6%
RADISYS (RSYS)	-63.6%
BLACK BOX	-62.0%
CHEROKEE (CHKE)	-60.4%
SURGERY PARTNERS	-54.5%
WINDSTREAM HOLDINGS	-54.4%

# DFA Small Cap Equity Sector Attribution

		DFA S	mall Cap Perfor	mance Attributio	on vs. Russell 20	00		
			Attribution Effect	s	R	eturns	Secto	r Weights
	Total	Selection	Allocation	Interaction				
	Effects	Effect	Effect	Effects	Portfolio	Benchmark	Portfolio	Benchmark
Energy	0.1%	0.1%	0.0%	0.0%	9.3%	6.5%	3.1%	3.4%
Materials	0.0%	0.0%	0.0%	0.0%	5.8%	6.8%	5.4%	4.4%
Industrials	0.3%	0.1%	0.1%	0.0%	9.2%	8.6%	19.6%	14.6%
Consumer Discretionary	-0.4%	-0.2%	-0.1%	-0.1%	1.7%	3.5%	16.1%	12.5%
Consumer Staples	0.1%	0.1%	-0.1%	0.1%	5.4%	2.7%	5.0%	2.7%
Health Care	-0.3%	-0.4%	-0.1%	0.2%	5.5%	7.8%	8.5%	15.1%
Financials	0.0%	0.0%	0.0%	0.0%	5.6%	5.5%	21.6%	18.5%
Information Technology	-0.1%	-0.1%	0.0%	0.0%	4.3%	4.9%	14.9%	17.1%
Telecommunication Services	0.1%	0.1%	0.0%	0.0%	7.5%	0.7%	1.2%	0.9%
Utilities	0.0%	0.0%	0.0%	0.0%	5.4%	5.2%	4.0%	3.7%
Real Estate	0.3%	0.1%	0.3%	-0.1%	3.1%	1.7%	0.6%	7.1%
Cash	0.0%						0.0%	0.0%
Portfolio	0.0%	= -0.3%	+ 0.1%	+ 0.1%	5.6%	5.6%	100.0%	100.0%

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## DFA Small Cap Return Based Style Analysis (3 Years)



#### **Quarterly and Cumulative Excess Performance**







#### eA US Small Cap Equity Gross Accounts

	Return (Rank)									
5th Percentile	9.4	9.4	16.9		18.2		17.8		11.9	
25th Percentile	6.7	6.7	14.1		16.2		16.0		10.0	
Median	5.5	5.5	12.4		14.9		14.7		8.9	
75th Percentile	4.3	4.3	10.3		13.3		13.4		7.8	
95th Percentile	1.8	1.8	5.3		9.9		10.9		5.9	
# of Portfolios	560	560	540		517		487		424	
PanAgora	5.9 (42	2) 5.9	(42) 12.4	(50)		()		()		()
Russell 2000	5.7 (46	6) 5.7	(46) 12.2	(54)	13.8	(68)	13.5	(73)	7.8	(75)

Characteristics		
	Portfolio	Russell 2000
Number of Holdings	305	2,000
Weighted Avg. Market Cap. (\$B)	2.3	2.2
Median Market Cap. (\$B)	0.9	0.8
Price To Earnings	22.8	24.6
Price To Book	4.1	3.2
Price To Sales	3.2	3.0
Return on Equity (%)	15.5	10.4
Yield (%)	1.1	1.1
Beta (holdings; domestic)	1.3	1.3

#### **Top Holdings**

PNM RESOURCES	1.5%
REALPAGE	1.3%
WALKER & DUNLOP	1.2%
PS BUSINESS PARKS	1.2%
LEXINGTON REALTY TRUST	1.1%
FIRST CTZN.BCSH.A	1.1%
INGEVITY	1.1%
PLEXUS	1.0%
SUPERNUS PHARMACEUTICALS	1.0%
ANIXTER INTL.	1.0%

#### **Best Performers**

	Return %
MYOKARDIA	227.1%
DYNAVAX TECHNOLOGIES	122.8%
SPECTRUM PHARMS. (SPPI)	88.9%
ARCBEST	62.9%
IMMUNOMEDICS (IMMU)	58.3%
MERITOR (MTOR)	56.6%
W&T OFFSHORE (WTI)	55.6%
PACIFIC BSCS.OF CAL. (PACB)	47.5%
ARRAY BIOPHARMA	47.0%
BOINGO WIRELESS	42.8%

#### **Worst Performers**

	Return %
DEPOMED (DEPO)	-46.1%
MOBILE IRON (MOBL)	-38.8%
BRIDGEPOINT EDUCATION (BPI)	-35.0%
GENESIS HEALTHCARE 'A' (GEN)	-33.3%
FRANCESCA'S HOLDINGS	-32.7%
EVOLENT HEALTH CL.A	-29.8%
3D SYSTEMS	-28.4%
HALLADOR ENERGY	-26.0%
APPROACH RESOURCES	-25.5%
EAGLE PHARMACEUTICALS (EGRX)	-24.4%

			Attribution Effects	6	R	eturns	Secto	r Weights
	Total	Selection	Allocation	Interaction				5
	Effects	Effect	Effect	Effects	Portfolio	Benchmark	Portfolio	Benchmark
Energy	0.1%	0.3%	0.0%	-0.1%	14.1%	6.5%	1.9%	3.4%
Materials	-0.1%	-0.1%	0.0%	0.0%	4.4%	6.8%	5.1%	4.4%
Industrials	-0.4%	-0.4%	0.0%	0.0%	6.0%	8.6%	15.8%	14.6%
Consumer Discretionary	0.1%	0.1%	0.0%	0.0%	4.1%	3.5%	10.5%	12.5%
Consumer Staples	0.1%	0.1%	0.0%	0.0%	5.2%	2.7%	2.2%	2.7%
Health Care	0.2%	0.2%	0.0%	0.0%	9.0%	7.8%	16.8%	15.1%
Financials	0.1%	0.1%	0.0%	0.0%	6.0%	5.5%	20.7%	18.5%
Information Technology	-0.3%	-0.3%	0.0%	0.0%	3.3%	4.9%	17.1%	17.1%
Telecommunication Services	0.2%	0.2%	0.0%	0.0%	28.5%	0.7%	0.8%	0.9%
Utilities	0.0%	0.0%	0.0%	0.0%	4.4%	5.2%	2.5%	3.7%
Real Estate	-0.1%	-0.1%	0.0%	0.0%	0.4%	1.7%	6.6%	7.1%
Cash	0.0%						0.0%	0.0%
Portfolio	0.0%	= 0.0%	+ 0.2%	+ -0.1%	5.7%	5.6%	100.0%	100.0%







#### **Quarterly and Cumulative Excess Performance**





	Actual	Actual
Copper Rock	\$29,964,857	14.7%
EARNEST Partners	\$110,760	0.1%
Mellon International	\$113,168,767	55.6%
Wells Capital	\$60,131,804	29.6%
Total	\$203,376,189	100.0%







	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank
International Equity	5.3%	72	12.2%	81	0.4	75
International Equity Custom	5.5%	66	11.5%	41	0.5	62
InvestorForce All DB ex-US Eq Gross Median	6.1%		11.7%		0.5	

- International Equity
- International Equity Custom
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce All DB ex-US Eq Gross



Ratio

Rank

58

46

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- 68% Confidence Interval
- InvestorForce All DB ex-US Eq Gross 0



#### InvestorForce All DB ex-US Eq Gross Accounts

	Return (Ranl	<)										
5th Percentile	7.8		7.8		8.8		10.9		8.7		4.6	
25th Percentile	6.8		6.8		7.1		9.3		7.5		3.1	
Median	6.2		6.2		6.1		8.4		6.6		2.1	
75th Percentile	5.5		5.5		5.2		7.5		5.7		1.2	
95th Percentile	4.5		4.5		3.6		6.2		4.7		0.0	
# of Portfolios	442		442		389		339		279		208	
International Equity	6.9	(23)	6.9	(23)	5.3	(72)	8.2	(58)	6.7	(45)	2.8	(29)
International Equity Custom	6.3	(49)	6.3	(49)	5.5	(66)	8.2	(59)	6.3	(57)	1.5	(68)

Ondiducteristics		
	Portfolio	MSCI ACWI ex USA Gross
Number of Holdings	1,078	1,859
Weighted Avg. Market Cap. (\$B)	54.9	62.9
Median Market Cap. (\$B)	9.6	8.0
Price To Earnings	22.6	21.1
Price To Book	3.4	2.6
Price To Sales	2.6	2.2
Return on Equity (%)	16.9	14.6
Yield (%)	2.5	2.8
Beta (holdings; global)	1.1	1.1

Characteristics

#### Top Holdings

rop noranigo	
SAMSUNG ELECTRONICS	1.7%
NESTLE 'R'	1.0%
ROYAL DUTCH SHELL B	1.0%
CHINA MOBILE	0.9%
AIA GROUP	0.9%
SINA	0.9%
TAIWAN SEMICON.SPN.ADR 1:5	0.9%
TENCENT HOLDINGS	0.8%
HSBC HDG. (ORD \$0.50)	0.8%
HDFC BANK ADR 1:3	0.8%

#### **Best Performers**

	Return %
B2W COMPANHIA DIGITAL ON	89.3%
FIAT CHRYSLER AUTOS.	71.0%
YASKAWA ELECTRIC	50.1%
WEIBO CLASS 'A' ADR	48.8%
AMG ADVD.METALLURGICAL GROUP (H:AMG)	48.6%
NEXT	46.5%
LOJAS AMERICANAS PN REP1 PN	44.0%
HOSIDEN (J:HOLE)	42.6%
LI & FUNG (K:FUNG)	42.2%
RPC GROUP (UKIR:RPC)	38.9%

#### Worst Performers

	Return %
PROVIDENT FINANCIAL (UKIR:PFG)	-64.7%
TEVA PHARMACEUTICAL	-46.8%
SIEMENS GAMESA RENEWABLE ENERGY (E:GAM)	-38.5%
MATAHARI DEPARTMENT SOE.	-35.3%
ORION 'B' (M:ORNB)	-27.2%
DIXONS CARPHONE (UKIR:DC.)	-26.5%
GEMALTO (H:GTO)	-25.5%
CHINA DSN.ED.HDG.ADS	-24.8%
AA (UKIR:AA.)	-23.2%
INTERTAPE POLYMER GP.	-22.8%

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#### eA EAFE Small Cap Equity Gross Accounts

	Return (Ranl	k)										
5th Percentile	11.3		11.3		16.4		17.9		14.8		9.2	
25th Percentile	9.3		9.3		13.5		15.9		13.5		6.8	
Median	8.4		8.4		12.2		14.5		12.0		5.3	
75th Percentile	7.2		7.2		11.1		12.9		10.8		4.9	
95th Percentile	5.6		5.6		8.8		11.1		9.5		2.9	
# of Portfolios	73		73		63		57		48		41	
Copper Rock	7.7	(68)	7.7	(68)	9.0	(94)		()		()		()
MSCI World ex US Small Cap GD	7.3	(73)	7.3	(73)	10.0	(88)	11.6	(94)	9.2	(97)		()

Characteristics		
	Portfolio	MSCI World ex USA Small Cap
Number of Holdings	91	2,470
Weighted Avg. Market Cap. (\$B)	3.1	2.7
Median Market Cap. (\$B)	2.9	1.1
Price To Earnings	20.7	20.3
Price To Book	3.2	2.6
Price To Sales	2.0	2.2
Return on Equity (%)	19.6	13.4
Yield (%)	2.2	2.2
Beta (holdings; global)	1.0	1.0

### Top Holdings

rop noranigo	
CEMBRA MONEY BANK N ORD	2.3%
RHEINMETALL	2.0%
DIASORIN	1.9%
ULVAC	1.9%
OPEN HOUSE	1.8%
ROYAL UNIBREW	1.8%
ASR NEDERLAND	1.7%
AMG ADVD.METALLURGICAL GROU	JP 1.6%
WIZZ AIR HOLDINGS	1.6%
ZENKOKU HOSHO	1.6%

### **Best Performers**

	Return %
AMG ADVD.METALLURGICAL GROUP (H:AMG)	48.6%
HOSIDEN	42.6%
RPC GROUP	38.9%
BANCA IFIS (I:IF)	34.8%
BIZLINK HOLDING	33.0%
ULVAC (J:ULVA)	30.7%
CKD (J:CKDC)	29.9%
GEORG FISCHER 'R'	27.3%
TODA	25.1%
PERSOL HOLDINGS (J:TMHD)	24.8%

#### **Worst Performers**

	Return %
INTERTAPE POLYMER GP.	-22.8%
ADASTRIA (J:POIT)	-17.8%
GREENCORE GROUP (UKIR:GNCL)	-17.6%
SKYWORTH DIGITAL HDG. (K:SKYD)	-16.8%
BLUESCOPE STEEL (A:BSLX)	-14.7%
AVEO GROUP (A:AOGX)	-12.1%
LION (J:LD@N)	-11.9%
NETENT	-11.3%
ATRESMEDIA CORP	-10.0%
NH FOODS	-9.5%

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eA All EAFE Equity Gross Accounts

5th Percentile	9.6	9.6	13.5	16.0	13.4	7.0
25th Percentile	7.4	7.4	9.4	12.0	9.8	4.7
Median	6.0	6.0	7.0	10.0	8.2	3.1
75th Percentile	5.2	5.2	5.4	8.6	7.1	2.0
95th Percentile	3.4	3.4	3.9	7.4	5.9	0.9
# of Portfolios	375	375	346	315	291	246
Mellon International MSCI EAFE Gross	5.4 (69) 5.5 (67)	5.4 (69) 5.5 (67)	() 5.5 (74)	() 8.9 (70)	() 6.9 (78)	() 1.8 (80)

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Characteristics		
	Portfolio	MSCI EAFE Gross
Number of Holdings	892	926
Weighted Avg. Market Cap. (\$B)	58.7	58.7
Median Market Cap. (\$B)	10.5	10.9
Price To Earnings	22.3	20.9
Price To Book	3.0	2.6
Price To Sales	2.4	2.1
Return on Equity (%)	15.6	13.6
Yield (%)	3.0	3.0
Beta (holdings; global)	1.1	1.1

#### Top Holdings

1 0	
NESTLE 'R'	1.9%
ROYAL DUTCH SHELL B	1.8%
HSBC HDG. (ORD \$0.50)	1.4%
NOVARTIS 'R'	1.4%
ROCHE HOLDING	1.3%
TOYOTA MOTOR	1.1%
BRITISH AMERICAN TOBACCO	1.0%
TOTAL	0.9%
BP	0.9%
BANCO SANTANDER	0.8%

#### **Best Performers**

	Return %
FIAT CHRYSLER AUTOS. (I:FCA)	71.0%
YASKAWA ELECTRIC (J:YE@N)	50.1%
NEXT	46.5%
LI & FUNG	42.2%
SANTOS (A:STOX)	35.7%
STMICROELECTRONICS (PAR) (F:STM)	35.3%
ANGLO AMERICAN	35.1%
WORLDPAY GROUP	33.8%
RAIFFEISEN BANK INTL. (O:RAI)	33.0%
NEXON (J:NXCL)	32.0%

#### Worst Performers

	Return %
PROVIDENT FINANCIAL	-64.7%
TEVA PHARMACEUTICAL (IS:TEV)	-46.8%
SIEMENS GAMESA RENEWABLE ENERGY (E:GAM)	-38.5%
ORION 'B'	-27.2%
DIXONS CARPHONE (UKIR:DC.)	-26.5%
GEMALTO (H:GTO)	-25.5%
HEALTHSCOPE	-21.1%
ERICSSON 'B'	-19.8%
ASICS	-19.6%
PROSIEBENSAT 1 MEDIA (D:PSM)	-19.2%





eA Emg Mkts Equity Gross Accounts

	Return (Rank	()										
5th Percentile	12.2	1:	2.2		11.1		10.3		6.6		6.4	
25th Percentile	9.5	1	9.5		8.0		7.6		5.3		4.0	
Median	7.8		7.8		6.3		5.8		4.1		2.8	
75th Percentile	5.7	:	5.7		4.7		4.7		3.0		1.8	
95th Percentile	3.3	:	3.3		1.6		2.4		1.6		0.5	
# of Portfolios	338	3	38		315		258		183		127	
Wells Capital	9.3	(29)	9.3	(29)	7.7	(29)	5.8	(51)		()		()
MSCI Emerging Markets Gross	8.0	(45)	8.0	(45)	5.3	(65)	4.4	(80)	2.9	(77)	1.7	(80)



Characteristics		
	Portfolio	MSCI Emerging Markets Gross
Number of Holdings	98	839
Weighted Avg. Market Cap. (\$B)	74.5	80.6
Median Market Cap. (\$B)	11.9	5.5
Price To Earnings	24.4	21.5
Price To Book	4.6	2.8
Price To Sales	3.5	2.2
Return on Equity (%)	18.1	17.4
Yield (%)	1.8	2.3
Beta (holdings; global)	1.1	1.0

#### **Top Holdings**

SAMSUNG ELECTRONICS	5.7%
CHINA MOBILE	3.2%
SINA	2.9%
TAIWAN SEMICON.SPN.ADR 1:5	2.9%
TENCENT HOLDINGS	2.9%
HDFC BANK ADR 1:3	2.6%
CHINA LIFE INSURANCE 'H'	2.3%
WH GROUP	2.2%
NEW ORIENTAL ED.& TECH. GP.ADS 1:1	2.1%
UNI-PRESIDENT ENTS.	2.1%

## **Best Performers**

	Return %
B2W COMPANHIA DIGITAL ON	89.3%
WEIBO CLASS 'A' ADR	48.8%
LOJAS AMERICANAS PN REP1 PN	44.0%
BAIDU 'A' ADR 10:1	38.5%
LOJAS RENNER ON	38.2%
CHINA INTL.CAP.'H'	37.9%
SBERBANK OF RUSSIA (LON) ADR	37.5%
51JOB SPN.ADR 1:1	35.5%
SINA	34.9%
BNC.BRADESCO PF.SPN.ADR 1:1	31.4%

#### Worst Performers

	Return %
MATAHARI DEPARTMENT SOE.	-35.3%
GEMALTO (H:GTO)	-25.5%
CHINA DSN.ED.HDG.ADS	-24.8%
AA (UKIR:AA.)	-23.2%
NEWELL BRANDS (NWL)	-20.0%
VIPSHOP HOLDINGS ADR 5:1	-16.7%
KT ADR 2:1	-16.6%
ADV.AUTO PARTS (AAP)	-14.9%
AMOREPACIFIC	-14.7%
TSINGTAO BREWERY 'H'	-12.5%



	Actual	Actual
Barrow Hanley	\$125,151,346	77.8%
Guggenheim Loan	\$35,762,719	22.2%
Total	\$160,914,065	100.0%





## US Fixed Income Risk vs. Return (3 Years)



	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank
US Fixed Income	3.3%	55	2.7%	51	1.1	36
US Fixed Custom	3.2%	59	3.0%	63	1.0	51
InvestorForce All DB US Fix Inc Gross Median	3.5%		2.7%		1.0	

- US Fixed Income
- US Fixed Custom
- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce All DB US Fix Inc Gross



## US Fixed Income Risk vs. Return (5 Years)



	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank	
JS Fixed Income	3.0%	54	2.7%	39	1.0	27	
JS Fixed Custom	2.4%	69	2.9%	56	0.7	56	
nvestorForce All DB US Fix nc Gross Median	3.1%		2.8%		0.8		

- ▲ Universe Median
- 68% Confidence Interval
- InvestorForce All DB US Fix Inc Gross





#### InvestorForce All DB US Fix Inc Gross Accounts

	Return (Rar	ık)										
5th Percentile	1.9		1.9		6.5		5.2		7.1		8.5	
25th Percentile	1.5		1.5		4.7		4.1		5.5		6.5	
Median	1.1		1.1		3.5		3.1		4.1		5.2	
75th Percentile	0.8		0.8		2.6		2.2		3.2		4.3	
95th Percentile	0.5		0.5		2.0		1.5		2.2		3.4	
# of Portfolios	477		477		430		393		315		237	
US Fixed Income	0.9	(66)	0.9	(66)	3.3	(55)	3.0	(54)	4.2	(48)	3.9	(86)
US Fixed Custom	0.9	(70)	0.9	(70)	3.2	(59)	2.4	(69)	3.2	(73)	4.5	(73)

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## US Fixed Income Bond Summary Statistics

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#### Quality Ratings US Fixed Income



#### Characteristics US Fixed Income



#### High Yield Quality Ratings US Fixed Income





#### eA US Core Fixed Inc Gross Accounts

	Return (Rar	ık)										
5th Percentile	1.2		1.2		4.1		3.6		4.6		5.9	
25th Percentile	1.0		1.0		3.4		2.9		3.8		5.2	
Median	0.9		0.9		3.1		2.5		3.5		4.9	
75th Percentile	0.8		0.8		2.8		2.2		3.2		4.6	
95th Percentile	0.6		0.6		2.5		1.9		2.8		4.1	
# of Portfolios	226		226		224		221		215		202	
Barrow Hanley	0.9	(51)	0.9	(51)	3.0	(59)	2.2	(74)	3.4	(59)		()
BBgBarc Aggregate	0.8	(69)	0.8	(69)	2.7	(82)	2.0	(92)	3.1	(82)		()

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#### eA Float-Rate Bank Loan Gross Accounts

	Return (Rank)					
5th Percentile	1.6	1.6	5.4	5.7	6.6	6.3
25th Percentile	1.3	1.3	4.8	5.0	5.9	5.5
Median	1.2	1.2	4.2	4.6	5.3	5.1
75th Percentile	1.0	1.0	4.0	4.2	4.9	4.7
95th Percentile	0.6	0.6	3.1	3.8	4.5	4.1
# of Portfolios	70	70	70	61	51	36
<ul> <li>Guggenheim Loan</li> </ul>	1.0 (82	2) 1.0 (82)	4.0 (84)	()	()	()
Credit Suisse Leveraged Loans	1.1 (74	l) 1.1 (74)	4.0 (84)	4.4 (65)	5.0 (71)	4.4 (87)

	Actual	Actual
Graham Absolute Return	\$3,010,069	13.1%
OZ Domestic II	\$16,887,578	73.6%
Wellington-Archipelago	\$3,040,561	13.3%
Total	\$22,938,208	100.0%







#### InvestorForce All DB Hedge Funds Gross Accounts

	Return (Rank)							
5th Percentile	3.6	3.6	6.8	8	.1	6.9	4.9	_
25th Percentile	2.5	2.5	3.9	6	.1	5.5	3.4	
Median	1.8	1.8	2.6	4	.9	4.4	2.7	
75th Percentile	1.2	1.2	1.1	3.	.9	3.6	2.2	
95th Percentile	0.0	0.0	-1.6	2.	.5	2.5	1.2	
# of Portfolios	200	200	185	17	'5	129	75	
Hedge Fund	2.7 (	(24) 2.7	(24) 4.2	(21)	()	(-	-) ()	
Hedge Fund Custom	2.3 (	(33) 2.3	(33) 3.2	(35)	()	(-	-) ()	



eV Alt All Multi-Strategy Accounts

	Return (Rai	nk)										
5th Percentile	8.3		8.3		14.7		15.7		13.8		12.7	
25th Percentile	4.0		4.0		8.2		9.0		8.3		8.6	
Median	2.0		2.0		4.0		5.2		5.4		5.2	
75th Percentile	0.7		0.7		1.3		2.6		3.3		3.9	
95th Percentile	-2.2		-2.2		-5.2		-2.7		-4.9		-4.3	
# of Portfolios	312		312		257		204		162		101	
OZ Domestic II	2.5	(41)	2.5	(41)	6.2	(37)		()		()		()
HFRI Fund of Funds Composite Index	2.3	(44)	2.3	(44)	2.2	(68)	3.8	(68)	2.9	(77)	1.1	(91)

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## Real Estate Manager Allocation Analysis

	Actual	Actual
Greenfield Gap VII	\$11,073,153	20.0%
Patron Capital V	\$2,777,483	5.0%
UBS Trumbull Property	\$41,628,185	75.0%
Total	\$55,478,821	100.0%







#### InvestorForce All DB Real Estate Pub+Priv Gross Accounts

	Return (Ra	ank)												
5th Percentile	3.1		3.1		11.1		12.7		13.0		14.0		7.3	
25th Percentile	2.1		2.1		8.6		11.2		12.0		12.8		5.8	
Median	1.7		1.7		7.0		10.5		11.2		12.0		5.0	
75th Percentile	1.0		1.0		5.6		9.4		9.8		10.7		3.6	
95th Percentile	0.0		0.0		1.3		6.7		7.5		9.0		1.8	
# of Portfolios	161		161		150		119		100		64		48	
Real Estate	1.7	(52)	1.7	(52)	5.3	(78)	8.9	(86)	9.0	(89)	9.8	(90)	5.1	(47)
NCREIF ODCE net	1.6	(54)	1.6	(54)	6.7	(57)	10.1	(60)	10.7	(65)	11.2	(69)	6.2	<mark>(15)</mark>

## Private Equity Manager Allocation Analysis



	Actual	Actual
Adams Street	\$8,386,786	23.7%
Invesco IV	\$3,202,712	9.0%
Invesco VI	\$5,224,931	14.7%
Ocean Avenue II	\$6,631,921	18.7%
Pantheon I	\$1,604,374	4.5%
Pantheon II	\$3,882,970	11.0%
Pantheon Secondary	\$1,643,732	4.6%
Raven Asset Fund II	\$4,855,614	13.7%
Total	\$35,433,040	100.0%





#### InvestorForce All DB Private Eq Net Accounts

	Return (R	ank)												
5th Percentile	5.8		5.8		21.1		15.6		16.3		15.7		10.8	
25th Percentile	4.0		4.0		16.1		12.4		13.7		12.8		8.5	
Median	2.9		2.9		12.6		9.1		10.5		10.3		7.1	
75th Percentile	0.3		0.3		9.5		6.6		8.7		9.2		6.0	
95th Percentile	-1.2		-1.2		2.4		1.4		4.3		4.8		1.5	
# of Portfolios	70		70		69		65		54		41		27	
Private Equity	3.0	(47)	3.0	(47)	7.5	(85)	5.8	(83)	6.3	(91)	8.9	(77)	7.3	(48)
Thomson Reuters Cambridge Pr	ivate Equity8l6	(37)	3.6	(37)	22.1	(5)	12.3	(26)	18.7	(2)	19.2	(1)	12.2	(1)

Total Plan Policy Index	As of:								
	7/1/17	1/1/17	1/1/15	7/1/14	7/1/13	6/1/13	4/1/13	4/1/12	1/1/10
91-day US T Bill									
BBgBarc Aggregate	17%	17%	21%	21%	29%	29%	24%	24%	24%
BBgBarc US TIPS							5%	5%	5%
BofA ML High Yield II			5%	5%	5%	5%	5%	5%	5%
CPI +4%									
Credit Suisse Leveraged Loan	5%	5%	3%	3%					
FTSE NAREIT Developed				1%	2%	2%	2%	2%	2.0%
FTSE NAREIT Developed ex US				1%					
HFRI Fund of Funds Composite	5%	2.5%	2.3%	5%					
HFRI RV Multi-strategy		2.5%	2.3%						
MSCI ACWI ex US			24%	24%	24%				
MSCI EAFE	16%	16%				20%	20%	20%	24%
MSCI Emerging Markets	7%	7%				4%	4%	4%	
NCREIF									
NCREIF ODCE				5%	6%	6%	6%	6%	6%
NCREIF ODCE net	8%	8%	8%						
Russell 1000	22%	22%	23%	23%	25%	25%			
Russell 2000	5%	5%	6%	6%	4%	4%	6%	6%	4%
Russell 3000 +3% 1QL (PE)		9%	7%	7%	5%	5%	5%		
S&P 400							4%	4%	
S&P 500							19%	19%	25%
S&P 500 +5% (PE)								5%	5%
S&P Global Infrastructure	3%	3%							
S&P Global Natural Resources	3%	3%							
Thomson Reuters Cambridge Private Equity	9%								
Wilshire RE									
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Total Plan Policy Index	As of:							
	10/1/08	7/1/08	1/1/08	4/1/07	4/1/05	1/1/02	1/1/99	1/1/95
91-day US T Bill								
BBgBarc Aggregate			1%	1%	1%	1%	1%	
BBgBarc US TIPS	23%	23%	30%	30%	30%	38%	38%	
BofA ML High Yield II								
CPI +4%								
Credit Suisse Leveraged Loan								100%
FTSE NAREIT Developed								
FTSE NAREIT Developed ex US								
HFRI Fund of Funds Composite								
HFRI RV Multi-strategy								
MSCI ACWI ex US								
MSCI EAFE								
MSCI Emerging Markets	18%	18%	7%	7%	7%	6%	6%	
NCREIF								
NCREIF ODCE	6%	6%	6%	6%	6%	5%		
NCREIF ODCE net								
Russell 1000								
Russell 2000								
Russell 3000 +3% 1QL (PE)	6%	6.25%	7.65%	7.9%	7.7%	8%	8%	
S&P 400								
S&P 500								
S&P 500 +5% (PE)	43%	43.75%	46.35%	47.1%	48.3%	42%	42%	
Wilshire RE	4%	3%	2%	1%				
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%



Total Plan w/o Al Policy Index	As of:				
	1/1/17	7/1/14	7/1/13	6/1/13	4/1/13
91-day US T Bill					
BBgBarc Aggregate	24%	25%	33%	33%	27%
BBgBarc US TIPS					6%
BofA ML High Yield II		6%	6%	6%	6%
CPI +4%					
Credit Suisse Leveraged Loan	7%	4%			
FTSE NAREIT Developed				2%	2%
FTSE NAREIT Developed ex US					
HFRI Fund of Funds Composite					
HFRI RV Multi-strategy					
MSCI ACWI ex US		29%	28%		
MSCI EAFE	22%			22%	22%
MSCI Emerging Markets	10%			4%	4%
NCREIF					
NCREIF ODCE					
NCREIF ODCE net					
Russell 1000	31%	28%	29%	28%	
Russell 2000	7%	7%	5%	4%	7%
Russell 3000 +3% 1QL (PE)					
S&P 400					4%
S&P 500					21%
S&P 500 +5% (PE)					
S&P Global Infrastructure					
S&P Global Natural Resources					
Wilshire RE					
	100.0%	100.0%	100.0%	100.0%	100.0%



US Equity Benchmark	As of:				
	7/1/14	6/1/13	1/1/95		
Russell 1000	80%	86%			
Russell 2000	20%	14%			
Russell 3000			100%		
	100.0%	100.0%	100.0%		
International Equity Benchmark	As of:				
	1/1/17	7/1/13	4/1/12	1/1/99	
MSCI ACWI ex US	<u> </u>	100%		10001	
MSCI EAFE	69.6%		83.3%	100%	
MSCI Emerging Markets	30.4%	400.00/	16.7%	400.00/	
	100.0%	100.0%	100.0%	100.0%	
Fixed Income Benchmark	As of:				
	1/1/17	8/1/14	7/1/14	6/1/13	4/1/13
BBgBarc Aggregate	77.3%	71.9%	82.5%	85.3%	70.6%
BBgBarc US TIPS					14.7%
BofA ML High Yield II		17.5%	17.5%	14.7%	14.7%
Credit Suisse Leveraged Loan	22.7%	10.5%			
	100.0%	100.0%	100.0%	100.0%	100.0%
Hedge Fund Benchmark	As of:				
	7/1/17	1/1/15	7/1/14		
HFRI Fund of Funds Composite	100%	50%	100%		
HFRI RV Multi-strategy		50%			
	100.0%	100.0%	100.0%		
Real Estate Benchmark	As of:				
	1/1/15	7/1/14	1/1/10	1/1/02	4/1/99
FTSE NAREIT Developed		17.5%	25%		
FTSE NAREIT Developed ex US		16.3%			
NCREIF				100%	
NCREIF ODCE		66.3%	75%		
NCREIF ODCE net	100%				
Wilshire RE	400.00/	400.00/	400.00/	400.00/	100%
	100.0%	100.0%	100.0%	100.0%	100.0%
Private Equity Benchmark	As of:				
	7/1/17	4/1/13	7/1/05		
Russell 3000 +3% 1QL		100%			
S&P 500 +5%			100%		
Thomson Reuters Cambridge Private Equity	100%				
Thomson Neuters Gambridge Frivate Equity	100 /0				

Infrastructure Benchmark	As of:	
	1/1/17	12/31/14
S&P Global Infrastructure	100%	
CPI-U Headline +5%		100%
	100.0%	100.0%

Natural Resources Benchmark	As of:	
	1/1/17	9/30/15
S&P Global Natural Resources	100%	
CPI-U Headline +5%		100%
	100.0%	100.0%

Real Asset Benchmark	As of:		
	1/1/17		
NCREIF ODCE net	57.1%		
S&P Global Infrastructure	21.4%		
S&P Global Natural Resources	21.4%		
	100.0%		

**1/1/95** 100.0%



Barrow Hanley Benchmark	As of: 6/1/13	A14140		
BBgBarc Aggregate	100%	<b>4/1/10</b> 82.8%		
BBgBarc US TIPS	100 /0	17.2%		
	100.0%	100.0%		
UBS Trumbull Benchmark	As of:			
	1/1/15	1/1/10	1/1/02	4/1/99
NCREIF			100%	
NCREIF ODCE		100%		
NCREIF ODCE net	100%			
Wilshire RE				100%
	100.0%	100.0%	100.0%	100.0%
KKD Clahal Banahmady	A			
KKR Global Benchmark	As of: 1/1/17	40/04/44		
S&P Global Infrastructure	100%	12/31/14		
CPI-U Headline +5%	100%	100%		
CFI-0 Headime +3 %	100.0%	100.0%		
	100.070	100.070		
North Haven Benchmark	As of:			
	1/1/17	5/31/15		
S&P Global Infrastructure	100%			
CPI-U Headline +5%		100%		
	100.0%	100.0%		
GSO Benchmark	As of:			
	1/1/17	11/30/15		
S&P Global Natural Resources	100%			
CPI-U Headline +5%		100%		
	100.0%	100.0%		
Taurus Mining Benchmark	As of:			
Taurus Milling Dencimark	AS 01. 1/1/17	9/30/15		
S&P Global Natural Resources	100%	9130113		
CPI-U Headline +5%	10070	100%		
	100.0%	100.0%		
	100.070	100.070		

## Glossary

Allocation Effect: An attribution effect that describes the amount attributable to the managers' asset allocation decisions, relative to the benchmark.

Alpha: The excess return of a portfolio after adjusting for market risk. This excess return is attributable to the selection skill of the portfolio manager. Alpha is calculated as: Portfolio Return - [Risk-free Rate + Portfolio Beta x (Market Return - Risk-free Rate)].

Benchmark R-squared: Measures how well the Benchmark return series fits the manager's return series. The higher the Benchmark R-squared, the more appropriate the benchmark is for the manager. Beta: A measure of systematic, or market risk; the part of risk in a portfolio or security that is attributable to general market movements. Beta is calculated by dividing the covariance of a security by the variance of the market.

**Book-to-Market:** The ratio of book value per share to market price per share. Growth managers typically have low book-to-market ratios while value managers typically have high book-to-market ratios. Capture Ratio: A statistical measure of an investment manager's overall performance in up or down markets. The capture ratio is used to evaluate how well an investment manager performed relative to an index during periods when that index has risen (up market) or fallen (down market). The capture ratio is calculated by dividing the manager's returns by the returns of the index during the up/down market, and multiplying that factor by 100.

**Correlation:** A measure of the relative movement of returns of one security or asset class relative to another over time. A correlation of 1 means the returns of two securities move in lock step, a correlation of -1 means the returns of two securities move in the exact opposite direction over time. Correlation is used as a measure to help maximize the benefits of diversification when constructing an investment portfolio.

**Excess Return:** A measure of the difference in appreciation or depreciation in the price of an investment compared to its benchmark, over a given time period. This is usually expressed as a percentage and may be annualized over a number of years or represent a single period.

Information Ratio: A measure of a manager's ability to earn excess return without incurring additional risk. Information ratio is calculated as: excess return divided by tracking error.

Interaction Effect: An attribution effect that describes the portion of active management that is contributable to the cross interaction between the allocation and selection effect. This can also be explained as an effect that cannot be easily traced to a source.

**Portfolio Turnover:** The percentage of a portfolio that is sold and replaced (turned over) during a given time period. Low portfolio turnover is indicative of a buy and hold strategy while high portfolio turnover implies a more active form of management.

**Price-to-Earnings Ratio (P/E):** Also called the earnings multiplier, it is calculated by dividing the price of a company's stock into earnings per share. Growth managers typically hold stocks with high price-to-earnings ratios whereas value managers hold stocks with low price-to-earnings ratios.

**R-Squared:** Also called the coefficient of determination, it measures the amount of variation in one variable explained by variations in another, i.e., the goodness of fit to a benchmark. In the case of investments, the term is used to explain the amount of variation in a security or portfolio explained by movements in the market or the portfolio's benchmark.

Selection Effect: An attribution effect that describes the amount attributable to the managers' stock selection decisions, relative to the benchmark.

Sharpe Ratio: A measure of portfolio efficiency. The Sharpe Ratio indicates excess portfolio return for each unit of risk associated with achieving the excess return. The higher the Sharpe Ratio, the more efficient the portfolio. Sharpe ratio is calculated as: Portfolio Excess Return / Portfolio Standard Deviation.

Sortino Ratio: Measures the risk-adjusted return of an investment, portfolio, or strategy. It is a modification of the Sharpe Ratio, but penalizes only those returns falling below a specified benchmark. The Sortino Ratio uses downside deviation in the denominator rather than standard deviation, like the Sharpe Ratio.

**Standard Deviation:** A measure of volatility, or risk, inherent in a security or portfolio. The standard deviation of a series is a measure of the extent to which observations in the series differ from the arithmetic mean of the series. For example, if a security has an average annual rate of return of 10% and a standard deviation of 5%, then two-thirds of the time, one would expect to receive an annual rate of return between 5% and 15%.

Style Analysis: A return based analysis designed to identify combinations of passive investments to closely replicate the performance of funds

**Style Map:** A specialized form or scatter plot chart typically used to show where a Manager lies in relation to a set of style indices on a two-dimensional plane. This is simply a way of viewing the asset loadings in a different context. The coordinates are calculated by rescaling the asset loadings to range from -1 to 1 on each axis and are dependent on the Style Indices comprising the Map.

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