Patient Capital:
Challenges and Opportunities in a Low Return World

Philanthropy Southwest Annual Conference

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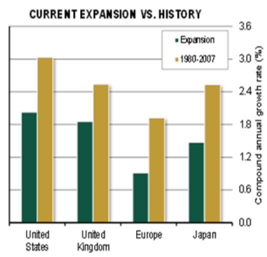
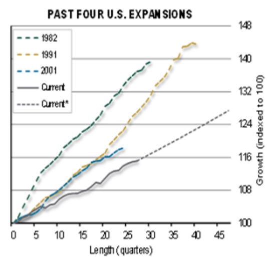
NORTHERN TRUST

FRAMING THE ISSUE: SLOW GROWTH ANGST

The slow growth environment will continue as lackluster demand shows few signs of abating. Concern over future growth will, in and of itself, impede growth further as consumers spend less and companies are hesitant to invest.

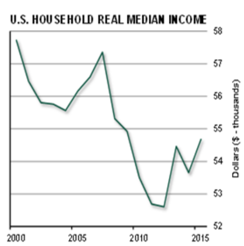


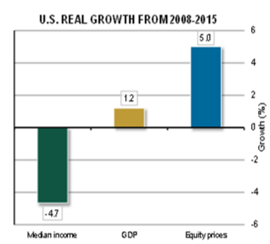


Sources: Northern Trust, International Monetary Fund, Bloomberg. *Current expansion continued at current growth rate for five years.

POPULIST ROULETTE

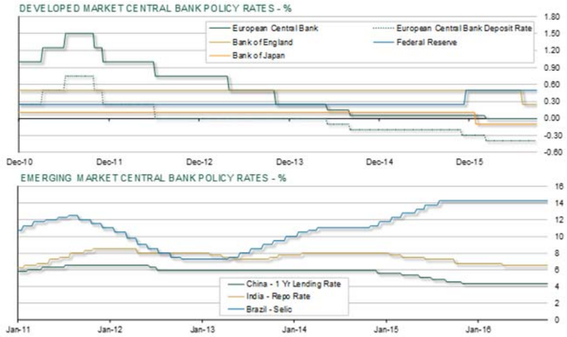
Anger over stagnant-to-falling real incomes has manifested into populist political movements globally. Concerns over what populist political candidates would do in office adds further uncertainty to the slow growth environment.





Sources: Northern Trust, Bloomberg, U.S. Census Bureau.

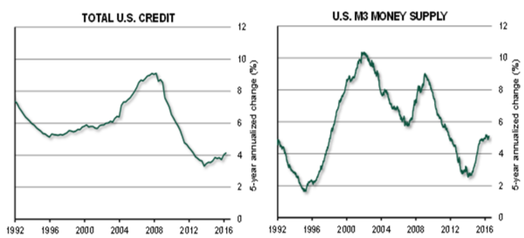
EVERYONE'S IN THE POOL



Source: Northern Trust, Bloomberg. Weekly data through 9/30/2016.

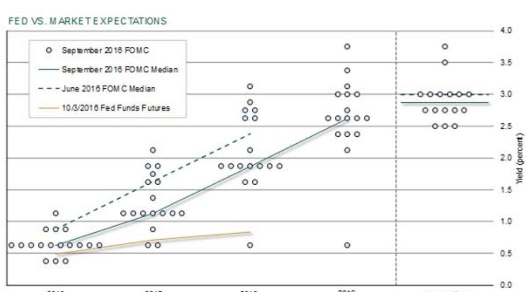
ASYMMETRY? COSTS OF ULTRA-LOW RATES

Recent cost/benefit analyses of ultra-accommodative interest rates are inconclusive – as costs rise and benefits are less apparent. Central bankers would like to exit, but the less risky (more likely) approach is more of the same.



Sources: Northern Trust, Federal Reserve, Encima Global.

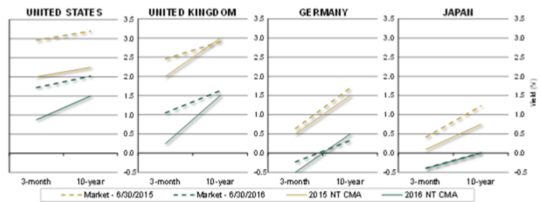
FED MONITOR: CURRENT FORECASTS (VS. PREVIOUS)



Source: Northern Trust, Bloomberg, Federal Open Market Committee (FOMC) Summary of Economic Projections. Most recent FOMC projections as of the 9/21/16 committee meeting. *Longer term represents FOMC expectations for w here the rate is expected to converge over time. Fed funds futures data as of 10/3/2016.

FIXED INCOME: INTEREST RATE EXPECTATIONS

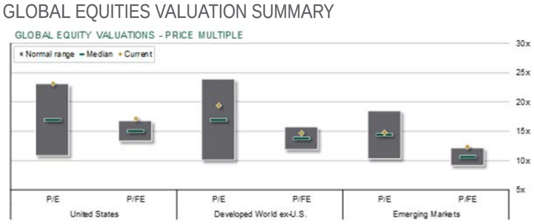
We remain lower for longer. As market expectations came down in the wake of Brexit, our expectations have been pushed down further.



- Slow growth and lack of inflationary pressures will keep interest rates low over the five-year horizon.
- The markets have priced in the economic challenges, but do not yet fully appreciate the effect of low rates globally.

Sources: Northern Trust, Bloomberg. NT CMA = Northern Trust Capital Market Assumption forecasts.

GLOBAL EQUITIES VALUATION SUMMARY

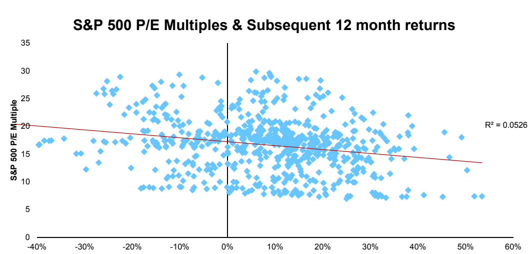


REGION	P/E		P/FE		P/B		P/CF		DIVIDEND YIELD	
	Current	LT Median	Current	LT Median	Current	LT Median	Current	LT Median	Current	LT Median
U.S.	23.2	16.9	17.2	15.0	2.9	2.3	13.6	9.6	2.1%	2.8%
World ex-U.S.	19.5	16.9	14.7	13.7	1.6	1.8	9.6	8.1	3.3%	2.9%
Europe	*21.4*	*14.3*	*14.8*	*12.7*	*1.7*	*1.7*	*10.1*	*7.0*	*3.6%*	*3.6%*
Japan	*15.6*	*21.9*	*13.5*	*14.8*	*1.2*	*1.9*	*7.6*	*8.4*	*2.3%*	*1.3%*
EM	14.7	14.3	12.4	10.6	1.5	1.7	8.8	8.3	2.6%	2.4%

Source: Northern Trust, MSCI. Monthly data through 9/30/2016. Indices are MSCI US, MSCI World ex-US, and MSCI Emerging Markets; U.S. and World ex-U.S. data begin in 1970, EM data begins in 1995. Normal Range: +/- 1 standard deviation from the median. LT: long-term.

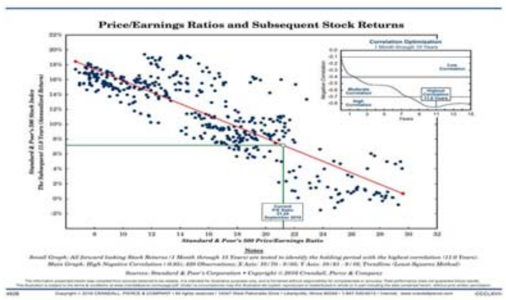
P/E MULTIPLES & S&P 500 RETURNS

Variation in P/E multiples on the S&P 500 explain just 5% of the variation of subsequent 12 month index returns



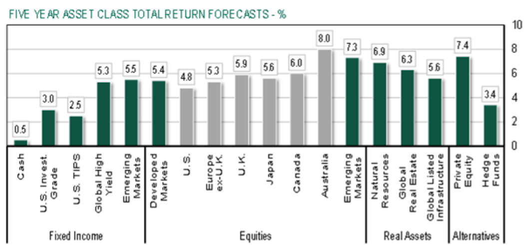
Source: Bloomberg, Northern Trust. Monthly P/E and return data beginning 1/29/1960 - 8/31/2016.

LONGER TERM, VALUATION MATTERS



FRAMING THE CHALLENGE: LOWER FOR EVEN LONGER

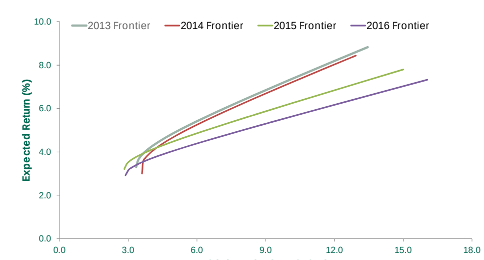
Global equity returns are expected to make slow progress in choppy market waters while global interest rates remain anchored at low levels over the next five years.



Sources: Northern Trust Capital Market Assumptions Working Group, Investment Policy Committee.
Five year forecasts developed annually; most recent forecasts released 7/18/2016.

EFFICIENT FRONTIERS (2013 – 2016)

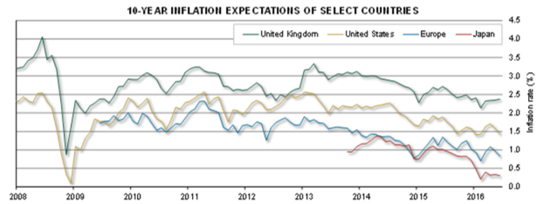
Lower expected returns for Risk Assets are reducing the slope of the efficient frontier



Source: Northern Trust Research. Shows efficient frontier for Accredited SAA model.

A BIT OF GOOD NEWS? STUCK-FLATION

The combination of supply/demand dynamics (low demand, "enough" supply) and low future inflation expectations will make it difficult for central bankers to dislodge "stuck" inflation over the five year horizon.



Sources: Northern Trust, Bloomberg. Note: Europe data (proxied by Germany) starts in 2009; Japan data starts in 2013.

LOWER FUTURE EQUITY RETURNS; SIMILAR REAL RETURNS?

Expected nominal returns are below historical average, but so too is expected inflation

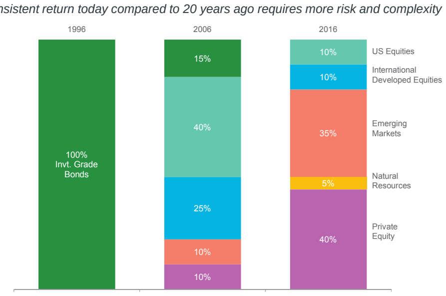
	Historical	Forecasted
Global Equity Returns	7.9%	5.8%
Inflation	2.9%	1.8%
Real Return	4.8%	4.0%

Sources: Northern Trust Research and Credit Suisse Investment Returns Yearbook 2016.

Historical Global Equity Returns are the Dimson, Marsh and Staunton globally diversified average equity returns from 1900 through 2015. Forecasted Global Equity Returns is the from Northern Trust Investment Policy Committee's 2016 capital market assumption for the MSCI ACWI IMI. Past performance is not indicative of or a guarantee of future results which will fluctuate as market and economic conditions change.

OUR CHALLENGE: ASSUMING MORE RISK TO ACHIEVE SAME RETURN

Achieving a consistent return today compared to 20 years ago requires more risk and complexity

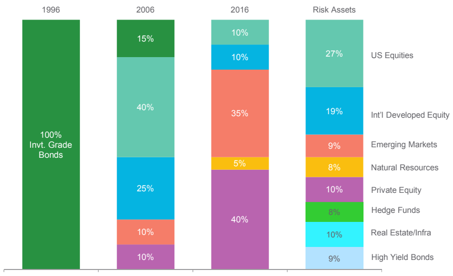


	1996	2006	2016
Expected Return	7.0%	7.0%	7.0%
Standard Deviation	4.7%	13.3%	19.4%

1996 expected return is based on the yield of the Barclays Agg. Bond Index in 1996. 1996 standard deviation is the historical 10 year standard deviation on the Barclays Agg. Bond Index through 1995. 2006 and 2016 expected returns and standard deviations are based on Northern Trust CMA's for their respective year.

ASSUMING MORE RISK TO ACHIEVE SAME RETURN

Achieving a consistent return today compared to 20 years ago requires more risk and complexity



	1996	2006	2016	Risk Assets
Expected Return	7.0%	7.0%	7.0%	6.0%
Standard Deviation	4.7%	13.3%	19.4%	16.0%

1996 expected return is based on the yield of Barclays Agg. Bond Index in 1996. 1996 standard deviation is the historical 10 year standard deviation on the Barclays Agg. Bond Index through 1995. 2006 and 2016 expected returns and standard deviations are based on Northern Trust CMA's for their respective year. Risk Assets is NT-sponsored optimization of Risk Assets anchored to market equilibrium as of 3/31/2016.

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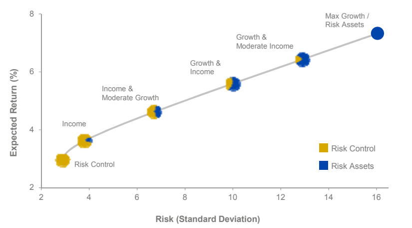
STRATEGIC ASSET ALLOCATION

Efficient Frontier



	Risk Control	Income	Income & Moderate Growth	Growth & Income	Growth & Moderate Income	Max Growth/ Risk Assets
Return	2.8%	3.2%	4.3%	5.0%	5.6%	6.0%
Risk	2.9%	3.2%	6.1%	9.5%	13.0%	16.0%

Source: 2016 Northern Trust IPC. Graph illustrates arithmetic returns per NT IPC Accredited Investment Objective. Table shows geometric returns per Investment Objective.

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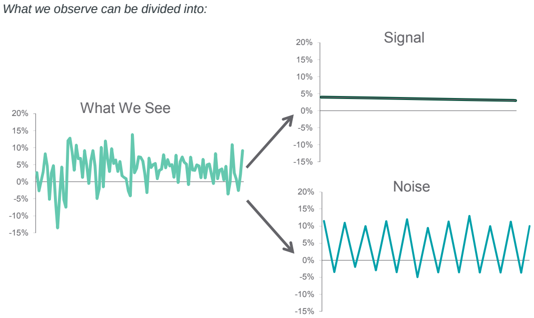
SEPARATE LONG-TERM SIGNAL FROM SHORT-TERM NOISE

What we observe can be divided into:



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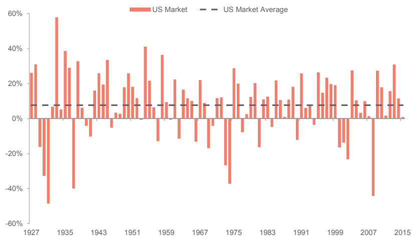
SIGNAL FROM NOISE – US MARKET FACTOR

(1927-2015)

Average Return (signal): 7.7%

Volatility (noise): 18.7%

- **It takes *23 Years* worth of market factor returns to distinguish a statistically significant return premium**



Source: Ken French Data Library. Data through December 2015. The graph shows calendar year factor returns. The average return (arithmetic) and volatility (standard deviation) are calculated from monthly returns.

Past performance is not indicative of or a guarantee of future results which will fluctuate as market and economic conditions change.

NOISE EXACERBATES BEHAVIORAL BIAS

Investors often react to short-term noise, but should focus on long-term signal

"Newsless" Headlines (i.e. no <u>new</u> information, but a lot of noise)

"Tech Stocks: Everyone is Getting Rich! Here's How to Get Your Share"

Money magazine, May 1999 cover

NASDAQ 100 returns -7% annualized over next 5 years

Recency bias / Illusion of control bias

"Worst Crisis Since 30's, With No End Yet in Sight"

The Wall Street Journal, September 18, 2008

S&P 500 returns +11% annualized over next 5 years

Recency bias / Hindsight bias / Loss aversion bias

CONTROL YOURSELF!

Short-term noise exacerbates behavioral bias

Avoid Illusion of Control Bias

Definition: The tendency to overestimate one's ability to control events

Example

You believe you can consistently pick stocks or time markets when returns are in fact largely random **(noise)**.

Avoid Recency Bias

Definition: The tendency to overweight the importance of recent observations (noise) relative to the full set of observations and information (signal).

Example

You sold out of emerging markets and natural resource stocks at the beginning of 2016 because they performed poorly in 2015.

GETTING YOUR FAIR SHARE: THE HIGH COST OF MISSING OUT

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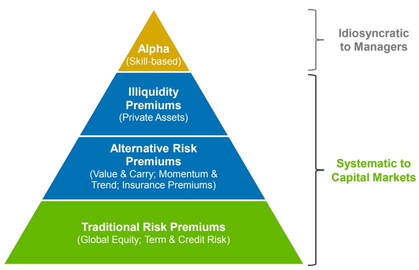
OTHER WEAPON: DIVERSIFICATION

Traditional risk premiums are the foundation of capital markets, but other sources of return are available to investors



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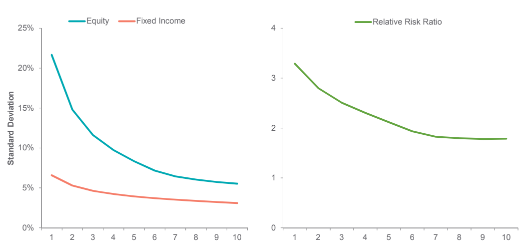
THE LUXURY OF A LONG TERM TIME HORIZON

Volatility is not linear



Sources: Northern Trust Research, Morningstar.
Standard deviation is calculated from return distributions formed from rolling one to ten year inflation-adjusted Ibbotson US Large Stock and Ibbotson Intermediate Government Bond returns from 1926 to 2015. The Relative Risk Ratio is the Equity SD/Fixed Income SD. These risk metrics are based on historical data and may be higher or lower over a given time period.

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SELECTIVE SCREENING FOR ACTIVE MANAGERS

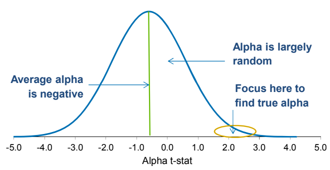
Factor-adjust alphas for risk, and solve for randomness (luck)

Key Principles

True alpha is rare.

Combine robust alphas (alpha t-stats) with selectivity (100% - R^2) to separate top performing managers with true alphas (true skill) from top performing managers with random alphas (luck).

The pursuit of skilled active managers requires a rigorous application of factor-based performance and risk analytics along with deep qualitative due diligence.



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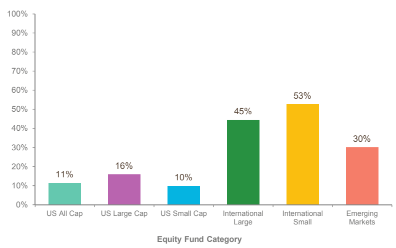
PERCENT OF ACTIVE EQUITY FUNDS THAT OUTPERFORMED THE INDEX

Five Years to December 2015



Source: S&P Dow Jones Indices LLC.

Sample includes funds available as of December 31, 2010 (5 years of performance data). Funds are categorized according to Lipper fund classification codes and are matched to their respective benchmarks at the beginning of the period. Survivors are funds that were still in existence as of December 2015 Non-survivors include funds that were either liquidated or merged. Outperforming funds are those whose cumulative return over the period exceeded that of their respective benchmark. All fund returns are net of fees and expenses.

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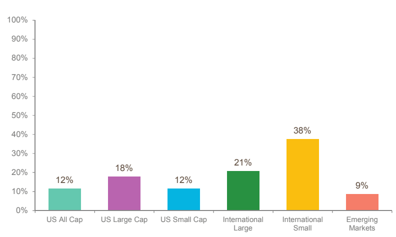
PERCENT OF ACTIVE EQUITY FUNDS THAT OUTPERFORMED THE INDEX

Ten Years to December 2015



Source: S&P Dow Jones Indices LLC.

Sample includes funds available as of December 31, 2005 (10 years of performance data). Funds are categorized according to Lipper fund classification codes and are matched to their respective benchmarks at the beginning of the period. Survivors are funds that were still in existence as of December 2015. Non-survivors include funds that were either liquidated or merged. Outperforming funds are those whose cumulative return over the period exceeded that of their respective benchmark. All fund returns are net of fees and expenses.

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ASSESS YOUR CONFIDENCE LEVEL AND RESPECT THE EVIDENCE

Market Factor Sharpe (1964) → **Size & Value Factors** Fama & French (1992) → **Momentum Factor** Jegadeesh & Titman (1993) → **Profitability** Novy-Marx (2013)

Market Factor: the return of equities over the return of the risk free asset (e.g. Treasury bills)

Size Factor: the return of small stocks over the return of large stocks

Value Factor: the return of value stocks (low price-to-book ratio) over the return of growth stocks (high price-to-book ratio)

Momentum Factor: the subsequent return of stocks with high prior 12-month returns over the subsequent return of stocks with low prior 12-month returns

Profitability Factor: the return of high profitability stocks over the return of low profitability stocks.

Sharpe, "Capital Asset Prices," Journal of Finance (1964); Fama and French, "Cross Section of Expected Stock Returns," Journal of Finance (1992); Jegadeesh and Titman, "Returns to Buying Winners and Selling Losers," Journal of Finance (1993). Novy-Marx, "The Other Side of Value – The Gross Profitability Premium," Journal of Financial Economics (2013)

SIZE, VALUE, MOMENTUM AND PROFITABILITY

Time Period: 1927 – 2015*

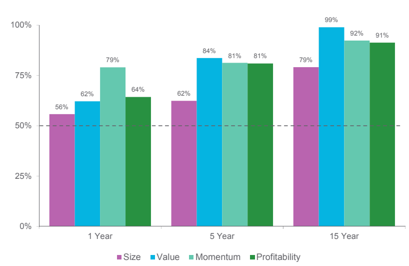
	Market Premium	Size Premium	Value Premium	Momentum Premium	Profitability Premium
Average Premium	7.72%	2.64%	4.58%	8.23%	2.94%
t-statistic	3.89	2.23	3.53	4.73	2.88
Standard Deviation	18.71%	11.19%	12.25%	16.43%	7.38%
Correlation to Market Premium	1.00	0.32	0.23	-0.34	-0.21

*Beginning date for each factor is based on its inception date.

Source: Ken French Data Library. Data is monthly frequency from 1927 through December 2015. Inception for profitability is 1964. Average Premium is the arithmetic average of the monthly factor returns.

US FACTOR PREMIUMS – LONG TERM RESULTS

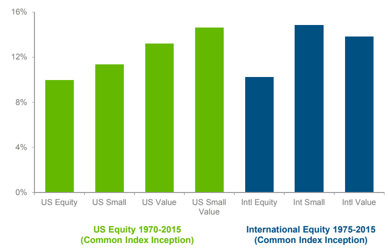
Percentage of Rolling Periods that are Positive



Source: Ken French Data Library. Monthly data from 1927 through December 2015. Inception for profitability is 1964.

SIZE AND VALUE EFFECTS GLOBALLY

Size and value effects are strong globally



Sources: Morningstar, Dimensional Fund Advisors. US equity is represented by MSCI USA, Fama French US Small, Fama French US Value and Fama French US Small Value Indices. International equity is represented by MSCI World ex-USA, Dimensional Small Cap and Fama French International Value Indices.

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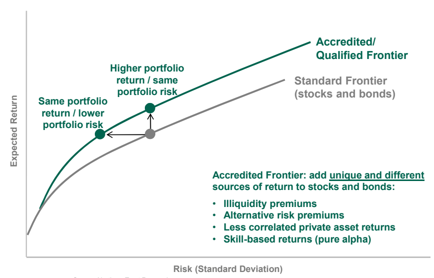
YOUR STRUCTURAL ADVANTAGE

Diversification Benefits



Source: Northern Trust Research.

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TAKE ADVANTAGE OF YOUR STRUCTURE AND TIME HORIZON: CAPTURE AN ILLIQUIDITY PREMIUM WITH PRIVATE EQUITY

Harris, Jenkinson, Kaplan and Stucke, "Private Equity Performance: What Do We Know?" *Journal of Finance (2014)*

	Buyout Funds			Venture Capital		
Vintage	Average	Median	Wtd. Avg.	Average	Median	Wtd. Avg.
1984	0.87	0.87	1.09	0.70	0.63	0.69
1985	0.97	0.91	0.91	0.71	0.70	0.73
1986	1.00	1.11	1.11	0.75	0.73	0.80
1987	1.25	1.21	1.20	1.18	1.09	1.29
1988	0.98	0.80	1.13	1.18	1.31	1.44
1989	1.26	1.28	1.22	1.34	0.95	1.52
1990	1.57	1.57	2.34	1.50	1.18	1.66
1991	1.23	1.23	1.32	1.37	1.26	1.35
1992	0.79	0.87	0.89	1.27	0.94	1.34
1993	1.35	1.11	1.24	2.79	1.54	2.74
1994	1.48	1.34	1.75	2.40	1.43	2.86
1995	1.34	1.00	1.20	2.16	1.48	2.09
1996	1.13	1.01	0.90	3.79	1.75	4.17
1997	1.23	1.16	1.30	2.43	1.45	2.65
1998	1.35	1.32	1.21	1.43	0.93	1.48
1999	1.19	1.06	1.27	0.76	0.65	0.90
2000	1.42	1.39	1.47	0.79	0.77	0.85
2001	1.31	1.43	1.38	0.80	0.71	0.84
2002	1.42	1.47	1.53	0.82	0.79	0.88
2003	1.75	1.56	1.58	0.88	0.90	0.99
2004	1.40	1.35	1.51	0.90	0.85	0.96
2005	1.20	1.19	1.23	1.27	0.95	1.23
2006	1.03	0.97	0.99	0.93	0.85	0.97
2007	1.03	1.03	1.02	0.97	0.96	0.99
2008	0.91	0.88	0.90	0.84	0.81	0.84
Average PME	**1.22**	**1.16**	**1.27**	**1.36**	**1.02**	**1.45**
Average TVPI	1.97	1.81	2.03	2.34	1.73	2.46
Average IRR	14.20	13.00	15.70	16.80	11.10	19.30

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MANAGER SELECTION AND QUARTILE PERSISTENCE

Harris, Jenkinson, Kaplan and Stucke, "Has Persistence Persisted in Private Equity?"

Bottom Buyout Managers Show Performance Persistence
(all quartiles beat public equity)

	Buyout Post-2000	Current Quartile 1	2	3	4	Current PME
Previous Quartile	Quartile 1	22.0%	28.8%	30.5%	18.6%	1.26
	Quartile 2	24.5%	22.6%	32.1%	20.8%	1.24
	Quartile 3	15.4%	28.2%	38.5%	17.9%	1.19
	Quartile 4	21.4%	14.3%	32.1%	32.1%	1.09

Top and Bottom Venture Managers Show Performance Persistence

	Venture Capital Post-2000	Current Quartile 1	2	3	4	Current PME
Previous Quartile	Quartile 1	48.1%	20.4%	25.9%	5.6%	1.49
	Quartile 2	23.5%	43.1%	11.8%	21.6%	1.07
	Quartile 3	17.0%	22.6%	41.5%	18.9%	0.96
	Quartile 4	22.9%	14.3%	34.3%	28.6%	0.90

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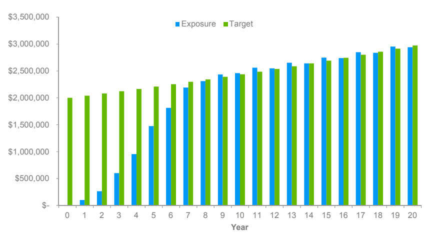
GET STARTED: PACE COMMITMENTS AND SEEK VINTAGE YEAR DIVERSIFICATION

A good rule of thumb: commit half the target every other year

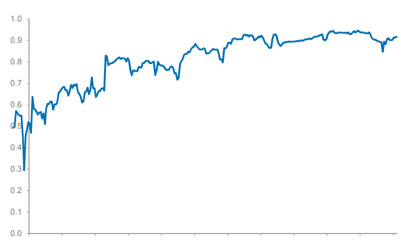


Source: Northern Trust Research

The information contained herein is for information and educational purposes only and does not constitute a recommendation for any investment strategy and is not intended as investment advice and is based on hypothetical returns. Hypothetical portfolio data contained herein does not represent the results of an actual investment portfolio. If the hypothetical portfolio would have been an actual portfolio it would have been subject to market and economic conditions that could have materially impacted performance and the results illustrated above.

THE CHALLENGE: MOST HEDGE FUNDS ARE NOT DIVERSIFYING

Rolling 36-month hedge fund correlation to global equity

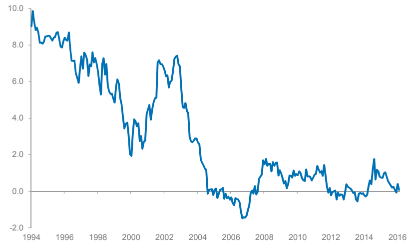


Source: Morningstar. Hedge funds are represented by the HFRI Fund-Weighted Composite Index. Global equity is the MSCI ACWI. Data through March 2016.

Past correlations between asset classes is not indicative of or a guarantee of future asset class correlations which will fluctuate as market and economic conditions change.

WHAT ABOUT HEDGE FUNDS?
THE CHALLENGE: MOST HEDGE FUNDS DO NOT DELIVER ALPHA

Rolling 36-month hedge fund alpha



Source: Northern Trust. Mladina, "Illuminating Hedge Fund Returns to Improve Portfolio Construction," *Journal of Portfolio Management* (2015) . Hedge funds are represented by the HFRI Fund-Weighted Composite Index. Alpha is estimated from a 9-factor model of systematic risk premiums. Data through March 2016.

Past correlations between asset classes is not indicative of or a guarantee of future asset class correlations which will fluctuate as market and economic conditions change.

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BE HIGHLY SELECTIVE IN MANAGER SELECTION

Traditional Stock/ Bond Portfolios	Global Market	Emerging Markets Premium	Global Term	Global Credit
Common Hedge Fund Exposures	Global Market	Emerging Markets Premium	Global Size	Global Credit

Focus on diversifying sources of return found in select hedge funds:

Alternative Risk Premiums	Global Value	Global Momentum	Commodity Momentum	Currency Premium*
Skill-based Returns	Factor-Adjusted Alpha			

■ Traditional risk premiums ■ Alternative risk premiums ■ Alpha

*Currency premium is a composite factor of currency value/carry and currency momentum.

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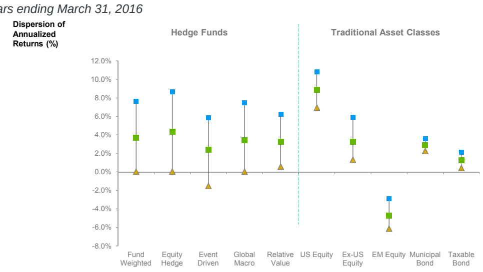
HEDGE FUNDS: SELECTIVITY IS KEY

Annualized manager returns by quartile
Three years ending March 31, 2016



Sources: Hedge Fund Research and Morningstar. Traditional asset class return dispersion based on Morningstar Institutional Category rankings.

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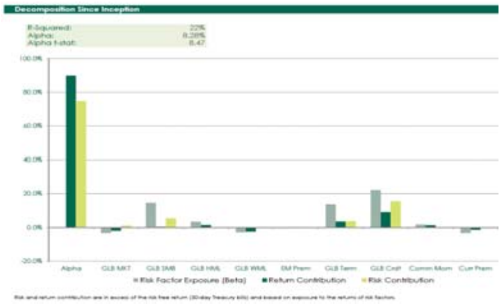
CASE STUDY: IDENTIFY ATTRACTIVE SKILL-BASED MANAGERS

Beyond a return premium, alpha (while rare) provides true diversification to the total portfolio



TRENDS IN LIQUIDITY MANAGEMENT

Money Market Reform

Floating NAV. Institutional prime and institutional tax-exempt money market funds must shift from the current constant net asset value (cNAV) pricing standard to a floating, or variable, net asset value (vNAV) standard.

Liquidity Fees and Redemption Gates. Subject to Board decision, all non-government money market funds (institutional and retail) are allowed to impose liquidity fees and redemption gates when weekly liquidity falls below certain thresholds.

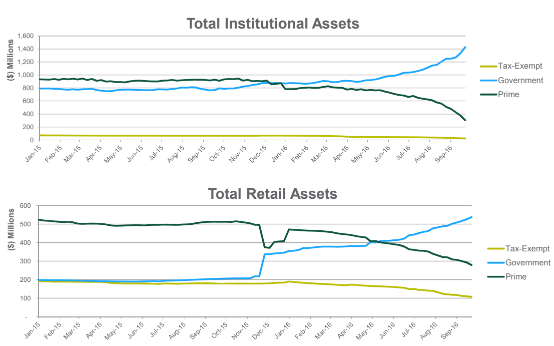
Government Funds Exempted. Not under scope for vNAV or fees and gates.

Market Implications

Higher Demand for Government Securities. The structural changes to money market funds has led to a shift away from short term credit and towards government paper, as investors look to avoid vNAV and the possibility of fees and gates.

Steeper Yield Curve for Credit. The yield differential between prime and government funds has widened from historical levels. We expect this trend to continue and credit to offer investors attractive relative value.

RETHINK CASH: MONEY IN MOTION



Source: ICI, Northern Trust Fixed Income

LIBOR TRENDS (PRIME MONEY MARKET FUNDS)

Source: Bloomberg, 10/3/16

CHALLENGES AND OPPORTUNITIES

Key Take-Aways

1. *Prepare for prospectively lower returns by assessing current portfolio structure and implementation*
2. *Disentangle signal from noise*
3. *Stay on course—there is a high cost of missing out*
4. *Focus on exposures with positive expected returns and high confidence*
5. *Sharpen your tools*
6. *Take advantage of your structural advantages to access the illiquidity premium and appropriate HF strategies—alpha is very valuable*
7. *Rethink your liquidity strategy*
8. *Control what you can control….get what you pay for*

Appendix

Philanthropy Southwest Annual Conference

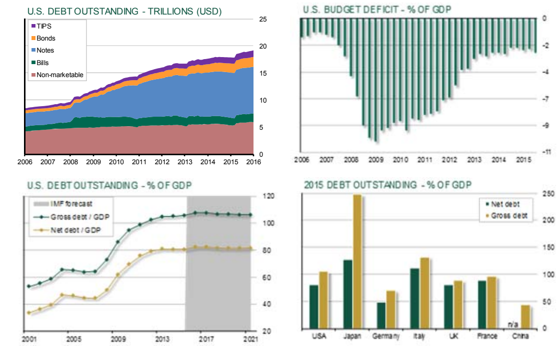
Katherine Ellis Nixon, CFA, CIMA, CPWA

Chief Investment Officer

Wealth Management

NORTHERN TRUST

GOVERNMENT FISCAL STATE



Source: Northern Trust, Bloomberg, IMF. Debt o/s: Monthly data through 8/31/2016.
Deficit/GDP: Quarterly data through 6/30/2016.

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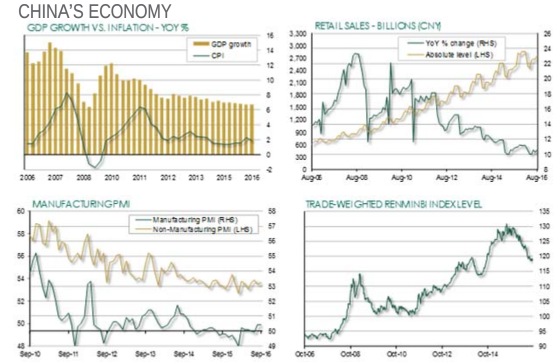
CHINA'S ECONOMY



Source: Northern Trust, Bloomberg, IMF. GDP & inflation: Quarterly data through 6/30/2016. Retail sales: Monthly data through 8/31/2016. Mfg PMI & Non-Mfg PMI: Monthly data through 9/30/2016. Renminbi level: Weekly data through 9/23/2016.

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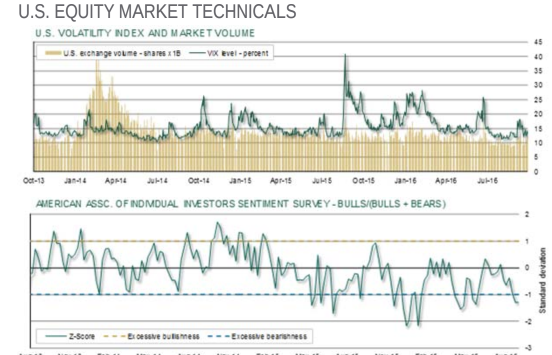
U.S. EQUITY MARKET TECHNICALS



Source: Northern Trust, Bloomberg. VIX & volume: Daily data through 9/30/2016. Survey: Weekly data through 9/29/2016.
Median covers period from 1988-present.

Past performance is no guarantee of future results. Periods greater than one year are annualized except where indicated. Returns reflect the reinvestment of dividends and other earnings and are shown before the deduction of investment management fees, unless indicated otherwise. Returns of the indexes also do not typically reflect the deduction of investment management fees, trading costs or other expenses. It is not possible to invest directly in an index. Indexes are the property of their respective owners, all rights reserved

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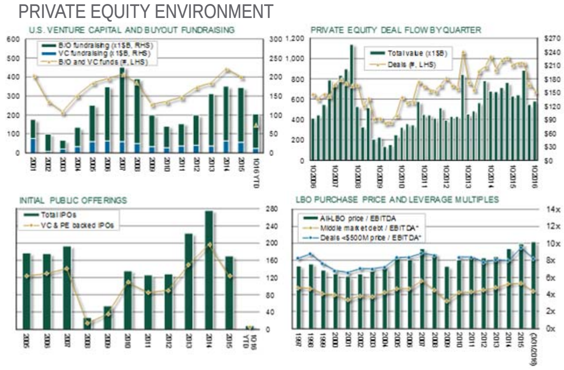
PRIVATE EQUITY ENVIRONMENT



Source: Northern Trust. Data through Q1 2016. Fundraising: Preqin & NVCA. Deal Flow: Pitchbook.
IPOs: Renaissance Capital. Deal multiples: LCD Stats; *Deals w/ EBITDA less than $50M.

THE CASE FOR GOING BEYOND TRADITIONAL STOCKS & BONDS

All assets in a globally diversified investment portfolio should serve a purpose. What purpose do these asset classes serve?

High Yield
- A diversified risk premium – credit vs. equity vs. term
- A source of income in a low interest rate environment
- Tactically compelling given slow (but positive) growth

Global Real Estate & Listed Infrastructure
- A source of income that can keep up with inflation
- "Hybrid" asset classes exposed to many risk premiums
- High- and low- "beta" cash flow asset options

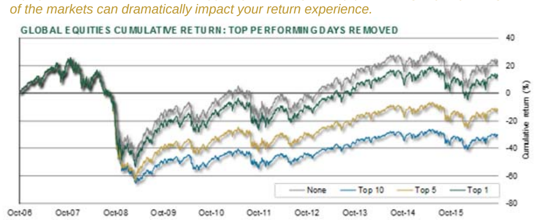
Natural Resources
- Longer-term protection against unanticipated inflation
- A potential mitigator of geopolitical risk impact on the portfolio
- Long-term potential despite short-term challenges

Treasury Inflation Protected Securities
- Near-term protection against unanticipated inflation
- Duration targeting allows more focus on inflation protection
- Currently low inflation expectations mean insurance is cheap

Source: Northern Trust.

THE CASE FOR STAYING FULLY INVESTED

Equity market returns come in lumpy ways. Missing the top performing days by being out of the markets can dramatically impact your return experience.

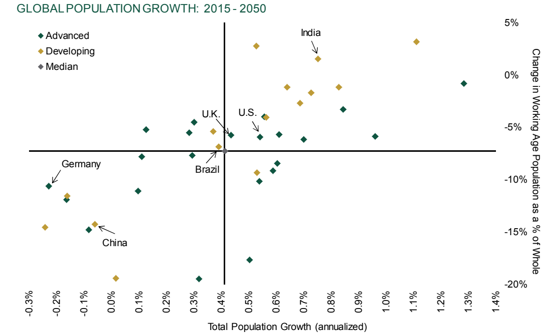


- Global equities gained 23% over the past ten years; missing just the top 5 returning days puts the portfolio in negative territory.
- Equity markets have bad days as well – but earn positive returns over time; the more days you are invested, the better your odds.

Source: Northern Trust. Bloomberg. Data from 10/04/2006 through 10/03/2016. MSCI ACWI Index represents global equity.

DEMOGRAPHICS

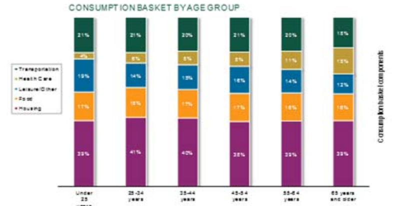
GLOBAL POPULATION GROWTH: 2015 - 2050



Source: Northern Trust, United Nations Population Division. Data series represents countries in the MSCI AC World index. Y-axis explanation using the U.S. as an example: Currently 64.2% of the population is working age; by 2050 that number is projected to fall to 55.6%, thus leading to the -8.6% figure seen on the scatter plot.

DEMOGRAPHICS – INFLATION

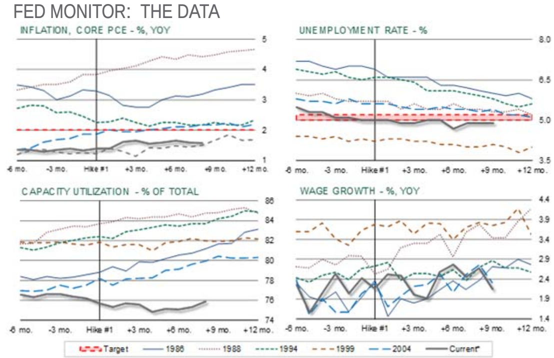
CONSUMPTION BASKET BY AGE GROUP



Category	Trailing 12 Month CPI		CPI Weight	Under 25 years	25-34 years	35-44 years	45-54 years	55-64 years	65 years and older	65-74 years	75 years and older
				Consumer Expenditure Categories by Age Group							
Food	1.6%		16.6%	16.9%	17.6%	16.9%	16.6%	16.5%	15.8%	16.5%	14.7%
Health Care	2.5%		8.5%	3.7%	6.3%	7.7%	8.4%	10.7%	15.4%	13.9%	17.9%
Housing	2.0%		43.8%	39.0%	40.9%	40.4%	38.4%	38.7%	38.9%	37.0%	41.9%
Leisure/Other	0.3%		15.1%	19.4%	14.3%	14.7%	15.9%	14.0%	11.7%	13.0%	9.6%
Transportation	-5.2%		16.0%	21.0%	21.0%	20.3%	20.7%	20.1%	18.2%	19.5%	15.9%
Reported		Implied									
CPI (YoY SA)	0.1%	CPI (YoY SA)	0.6%	0.1%	0.2%	0.3%	0.2%	0.3%	0.5%	0.4%	0.7%
CPI - core (YoY SA)	1.8%	CPI ex-Food and Transport ("Core"; YoY SA)	1.7%	1.5%	1.7%	1.7%	1.6%	1.7%	1.8%	1.8%	1.9%

Source: Northern Trust, Bloomberg, Bureau of Labor Statistics. Data through: October 2015. Weights include Northern categorical assumptions to compare data betw een CPI and Consumer Expenditure data sets.

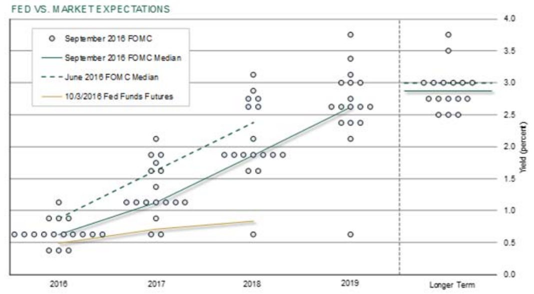
FED MONITOR: THE DATA



Source: Northern Trust, Bloomberg. *Current series starts w ith the Dec. 2015 Fed rate hike.
Historic w age grow th: production & non-supervisory w orkers; current w age grow th: total private sector w orkers. Inflation: current data as of 8/31/2016; Unemployment: current data as of 8/31/2016; Capacity: current data as of 8/31/2016; Wages: current data as of 8/31/2016.

FED MONITOR: CURRENT FORECASTS (VS. PREVIOUS)

FED VS. MARKET EXPECTATIONS



Source: Northern Trust, Bloomberg, Federal Open Market Committee (FOMC) Summary of Economic Projections. Most recent FOMC projections as of the 9/21/16 committee meeting. *Longer term represents FOMC expectations for w here the rate is expected to converge over time. Fed funds futures data as of 10/3/2016.

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