Wilshire

Numbers In Context 3Q16

Asset Class Performance

Wilshire

Annual Asset Class Returns - Best to Worst

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	YTD 2016	Annualized 5-Year as of Sept 16'
REITs 36.0%	Emrg Mrkts 39.8%	Core Bond 5.2%	Emrg Mrkts 79.0%	MLPs 35.9%	MLPs 13.9%	Emrg Mrkts 18.06	U.S. Equity 33.1%	REITs 31.8%	REITs 4.2%	Emrg Mrkts 16.4%	U.S. Equity 16.3%
Emrg Mrkts 32.6%	Commodities 16.2%	T-Bills 2.1%	MLPs 76.4%	REITs 28.6%	U.S. TIPS 13.6%	Developed 17.9%	MLPs 27.6%	U.S. Equity 12.7%	U.S. Equity 0.7%	MLPs 15.9%	REITs 15.8%
Developed 26.9%	MLPs 12.7%	U.S. TIPS -2.4%	High Yield 58.2%	Emrg Mrkts 19.2%	REITs 9.2%	REITs 17.6%	Developed 23.3%	Core Bond 6.0%	Core Bond 0.6%	High Yield 15.1%	High Yield 8.3%
MLPs 26.1%	U.S. TIPS 11.6%	High Yield -26.2%	Developed 32.5%	U.S. Equity 17.2%	Core Bond 7.8%	U.S. Equity 16.1%	High Yield 7.4%	MLPs 4.8%	T-Bills 0.1%	REITs 9.7%	Developed 7.9%
U.S. Equity 15.8%	Developed 11.6%	Commodities -35.7%	REITs 28.6%	Commodities 16.8%	High Yield 5.0%	High Yield 15.8%	REITs 1.9%	U.S. TIPS 3.6%	Developed -0.4%	Commodities 8.9%	MLPs 5.0%
High Yield 11.9%	Core Bond 7.0%	MLPs -36.9%	U.S. Equity 28.3%	High Yield 15.1%	U.S. Equity 1.0%	U.S. TIPS 7.0%	T-Bills 0.1%	High Yield 2.5%	U.S. TIPS -1.4%	U.S. Equity 8.4%	Emrg Mrkts 3.4%
T-Bills 4.8%	U.S. Equity 5.6%	U.S. Equity -37.2%	Commodities 18.9%	Developed 8.2%	T-Bills 0.1%	MLPs 4.8%	Core Bond -2.0%	T-Bills 0.0%	High Yield -4.5%	U.S. TIPS 7.3%	Core Bond 3.1%
Core Bond 4.3%	T-Bills 5.0%	REITs -39.2%	U.S. TIPS 11.4%	Core Bond 6.5%	Developed -11.7%	Core Bond 4.2%	Emrg Mrkts -2.3%	Emrg Mrkts -1.8%	Emrg Mrkts -14.6%	Core Bond 5.8%	U.S. TIPS 1.9%
Commodities 2.1%	High Yield 1.9%	Developed -43.1%	Core Bond 5.9%	U.S. TIPS 6.3%	Commodities -13.3%	T-Bills 0.1%	U.S. TIPS -8.6%	Developed -4.5%	Commodities -24.7%	Developed 2.2%	T-Bills 0.1%
U.S. TIPS 0.4%	REITs -17.6%	Emrg Mrkts -53.2%	T-Bills 0.2%	T-Bills 0.1%	Emrg Mrkts -18.2%	Commodities -1.0%	Commodities -9.5%	Commodities -17.0%	MLPs -32.6%	T-Bills 0.2%	Commodities -9.4%

Data sources: Wilshire Compass

Note: Developed asset class is developed markets ex-U.S., ex-Canada.

September 2016 Asset Class Assumptions

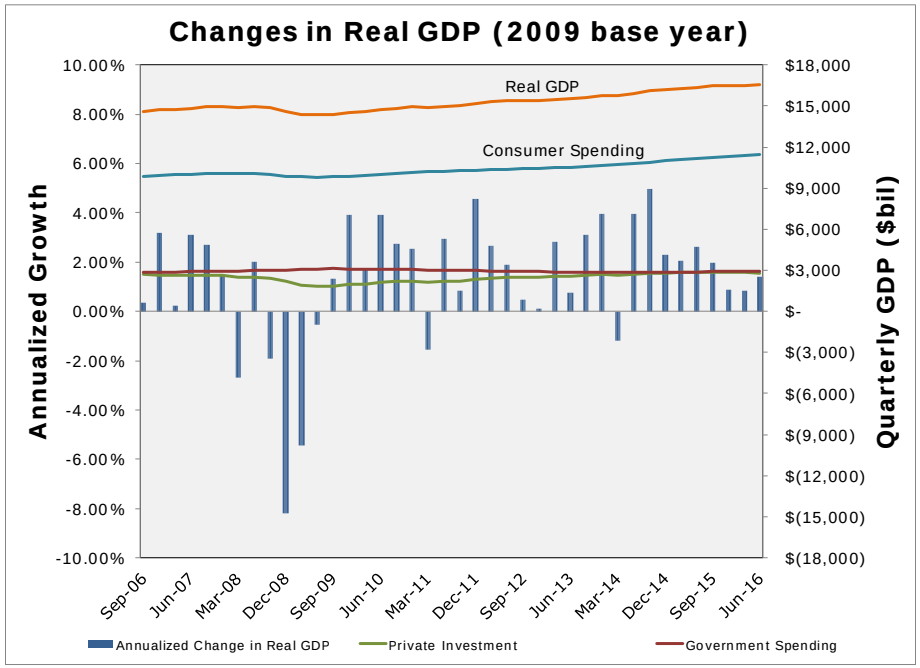
Wilshire

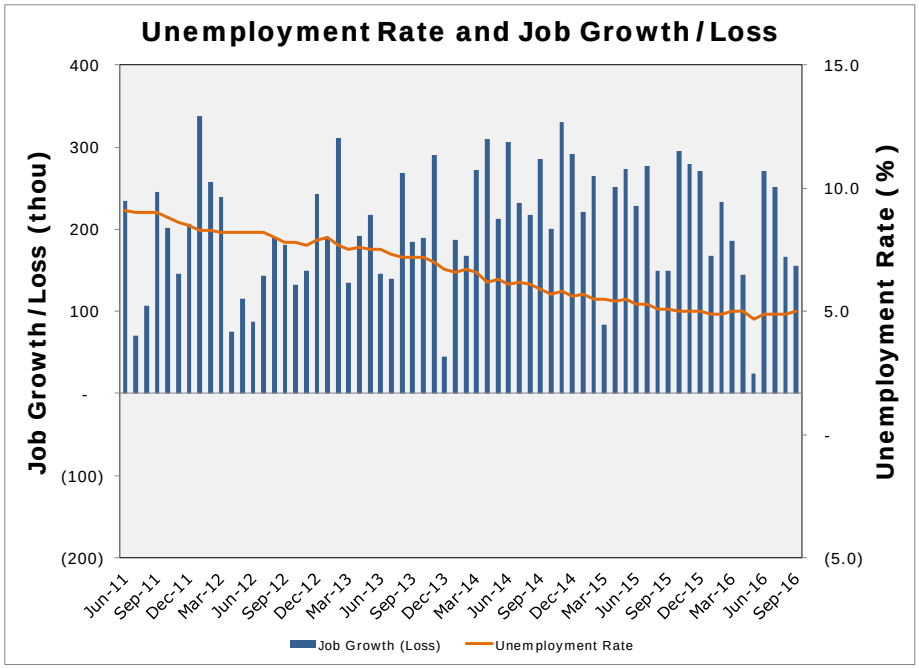
	Total Return (%)			Risk (%)
	Dec. 2015	Q3 2016	Change vs YE	Dec. 2015
Investment Categories:				
U.S. Stocks	6.50	6.25	(0.25)	17.00
Dev ex-U.S. Stocks	6.50	6.25	(0.25)	18.00
Emerging Mkt Stocks	6.50	6.25	(0.25)	26.00
Global Stocks	6.70	6.45	(0.25)	17.10
Private Markets	9.50	8.85	(0.65)	27.50
Cash Equivalents	1.25	1.25	-	1.25
Core Bonds	3.50	2.85	(0.65)	5.00
LT Core Bonds	4.30	3.20	(1.10)	10.00
TIPS	3.25	2.40	(0.85)	6.00
High Yield Bonds	6.35	5.15	(1.20)	10.00
EMD Local Currency (h)	5.60	3.85	(1.75)	5.00
U.S. RE Securities	5.00	4.90	(0.10)	17.00
Private Real Estate	5.80	6.10	0.30	14.00
Commodities	3.55	3.60	0.05	15.00
MLPs	9.65	8.45	(1.20)	17.00
Real Asset Basket	6.40	5.95	(0.45)	8.40
Inflation:	1.55	1.60	0.05	1.75
Returns minus Inflation:				
U.S. Stocks	4.95	4.65	(0.30)	
U.S. Bonds	1.95	1.25	(0.70)	
Cash Equivalents	(0.30)	(0.35)	(0.05)	
Stocks minus Bonds:	3.00	3.40	0.40	
Bonds minus Cash:	2.25	1.60	(0.65)	

Economic Review

September 30, 2016	Key Economic Indicators			
CPI (all items)	Monthly Change		Cumulative Change	
Seasonally adjusted	Sep-16	0.3	3-Month	0.5
	Aug-16	0.2	12-Month	1.5
	Jul-16	0.0	10-Yr Annual	1.7
Breakeven Inflation	10-Year	1.6		
Consumer Sentiment	Sep-16	91.2		
Unv. of Michigan Survey	Aug-16	89.8		
	1-Yr Ago	87.2	10-Yr Avg	77.9
Manufacturing	Sep-16	51.5	Change in Manufacturing Sector	
Inst. for Supply Mgmt	Aug-16	49.4	>50	Expansion
Purchasing Mngrs' Idx	1-Yr Avg	50.3	<50	Contraction

Note: Seasonally adjusted CPI data is utilized to better reflect short-term pricing activity.



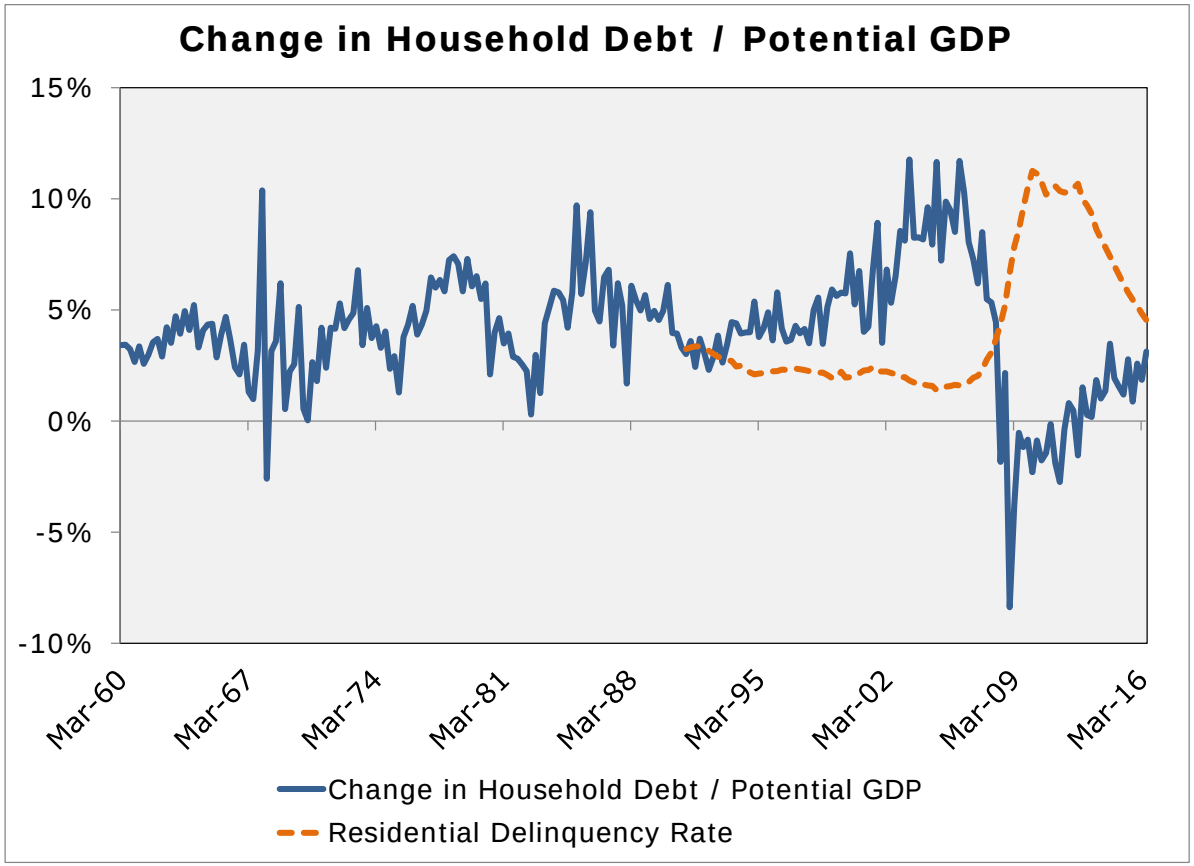


Data sources: Bureau of Economic Analysis, Bureau of Labor Statistics, Federal Reserve Bank of St. Louis, Barclays Capital

Debt: Where are we now?

Wilshire

- Eight years since the debt crisis hit in full
- After a period where mortgage defaults dominated net borrowing, consumer credit is beginning to trend just below the historical average



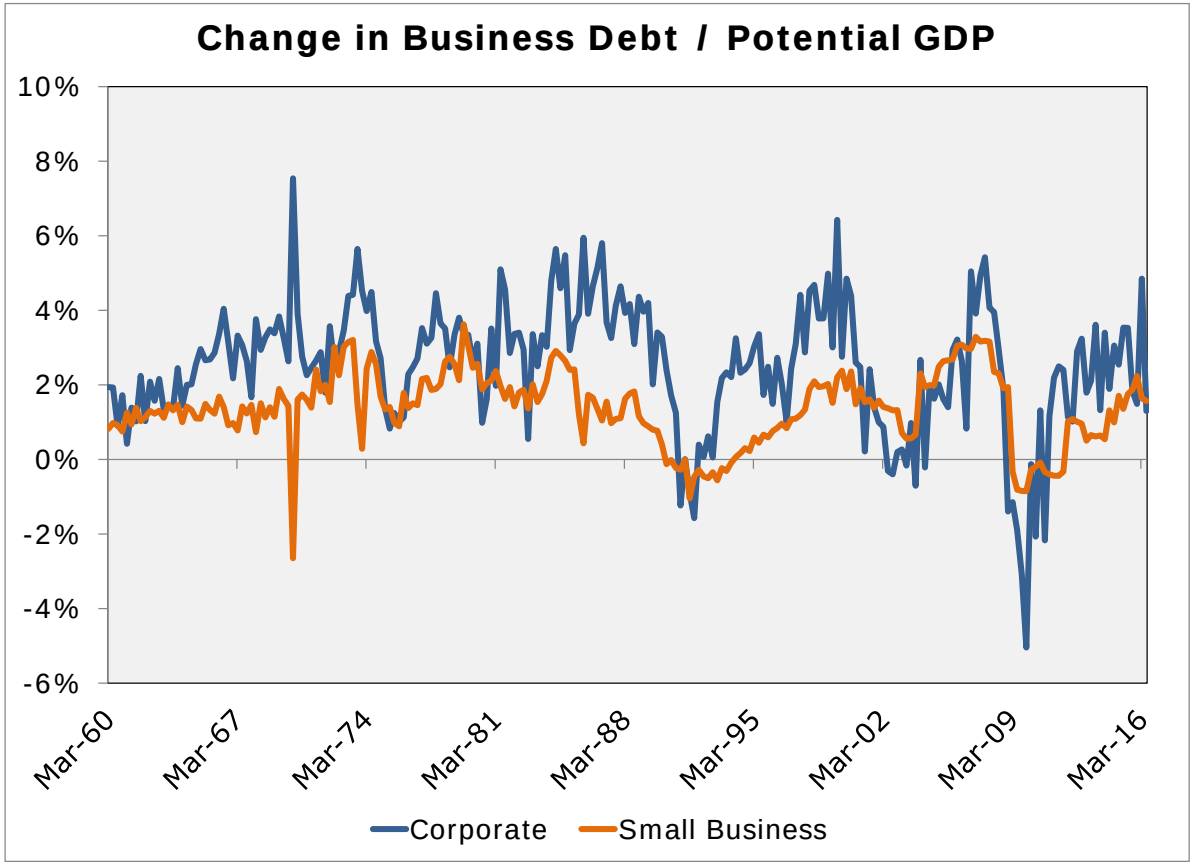
- Note: Potential GDP (estimated GDP at full employment) is utilized as it is more stable than actual GDP, therefore changes are being driven by the debt figure (the numerator)

Source: Federal Reserve, Congressional Budget Office

Debt: Where are we now?

Wilshire

- Debt growth in the private sector has normalized, as well
- Borrowing in small businesses, which are more reliant on U.S. demand, is moving towards the historical average

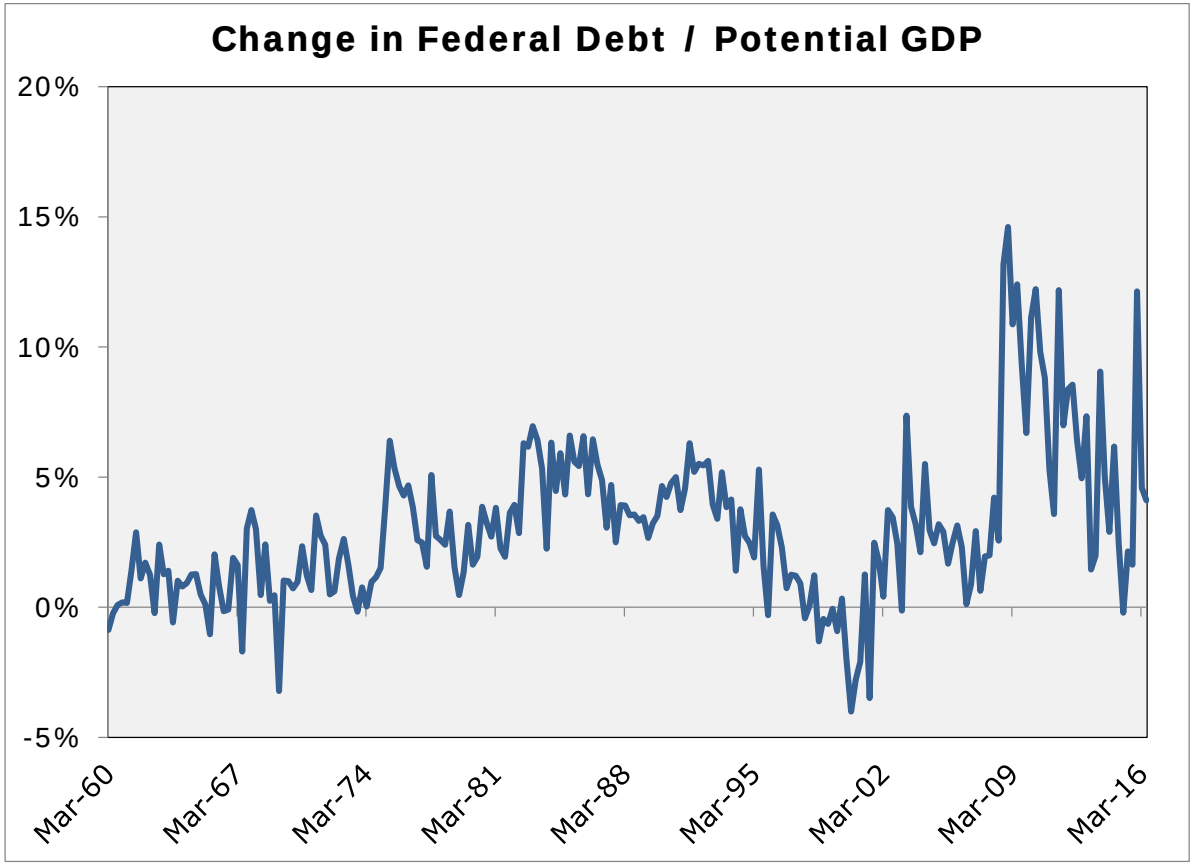


Source: Federal Reserve, Congressional Budget Office

Debt: Where are we now?

Wilshire

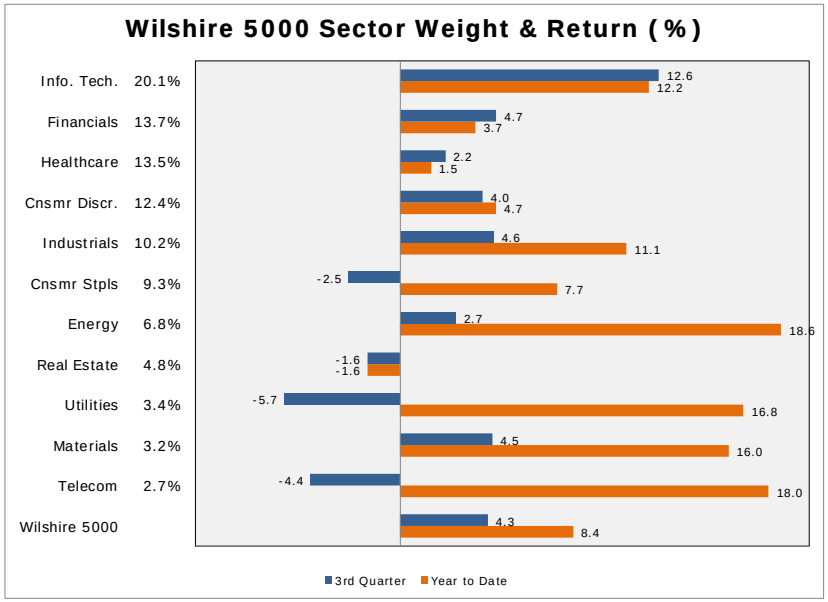
- Federal government drove new debt creation after the crisis
- Growth trending downward but with occasional spikes
- Total public debt / GDP has gone from 63% for year-end 2007 to 105% mid-year 2016

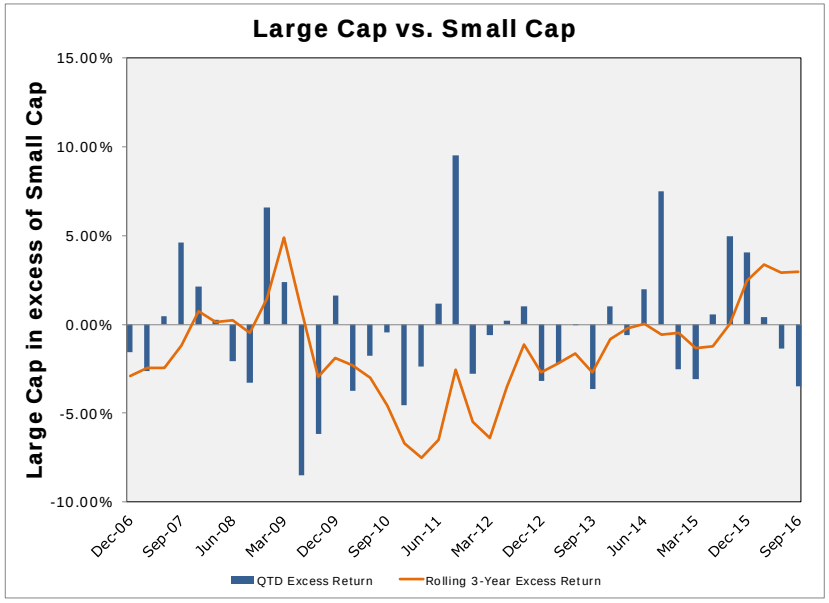


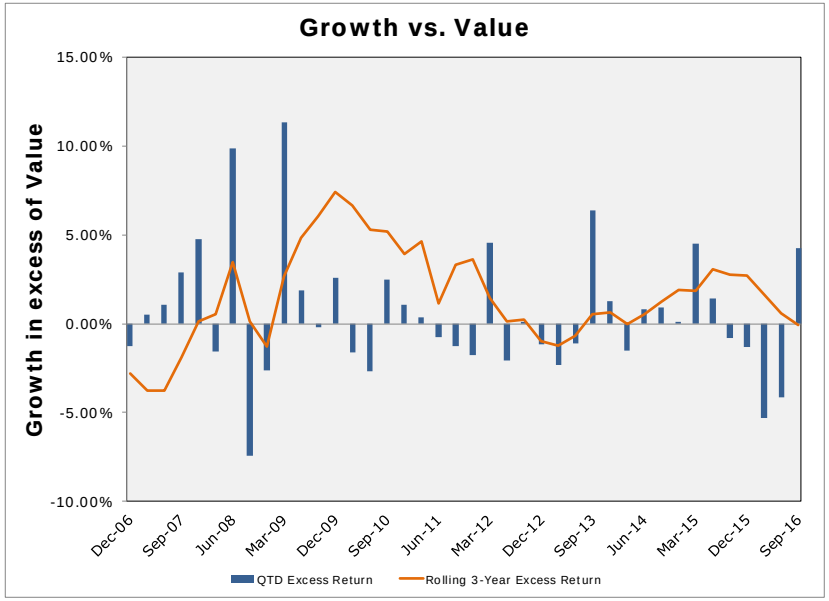
Source: Federal Reserve, Congressional Budget Office

U.S. Equity Market

September 30, 2016	Qtr	Ytd	1 Yr	3 Yr	5 Yr	10 Yr
Wilshire 5000	4.3	8.4	15.3	10.7	16.3	7.4
Wilshire U.S. Large Cap	3.9	8.0	15.3	11.0	16.3	7.3
Wilshire U.S. Small Cap	7.7	13.0	16.0	7.8	16.9	8.7
Wilshire U.S. Large Growth	6.2	4.9	11.2	11.2	16.7	8.4
Wilshire U.S. Large Value	1.8	10.6	18.8	10.7	15.8	6.2
Wilshire U.S. Small Growth	9.4	8.7	10.5	5.2	15.4	8.9
Wilshire U.S. Small Value	6.1	17.1	21.2	10.2	18.2	8.5
Wilshire REIT Index	-1.2	9.7	17.9	14.3	15.8	5.9
MSCI USA Minimum Volatility Index	-1.3	9.9	16.6	12.7	15.1	8.0
FTSE RAFI U.S. 1000 Index	4.1	9.6	15.8	10.0	16.6	8.0





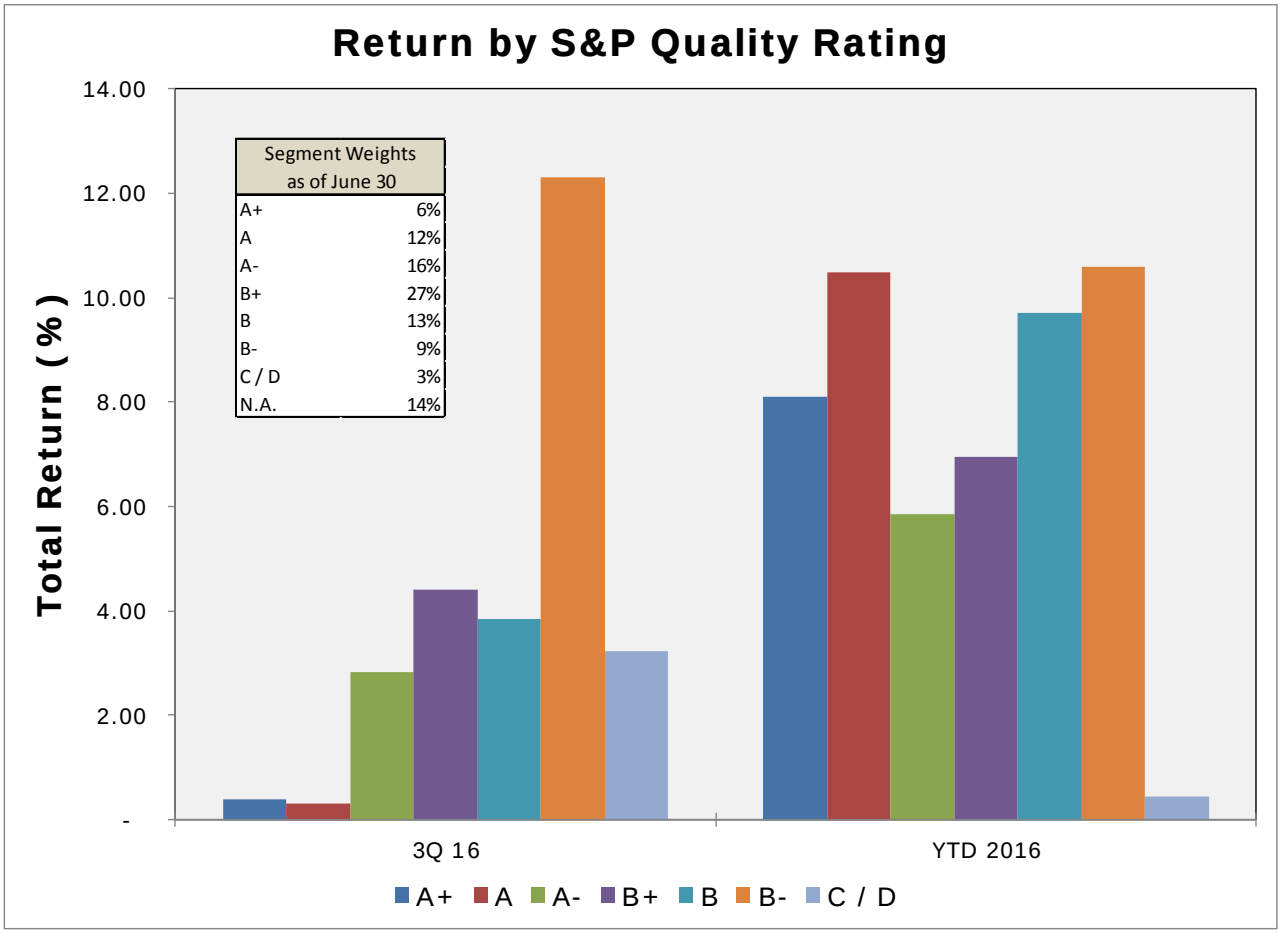


Data sources: Wilshire Compass, Wilshire Atlas

Returns by Quality Segment

Wilshire

Relatively strong returns across most quality ratings for 2016

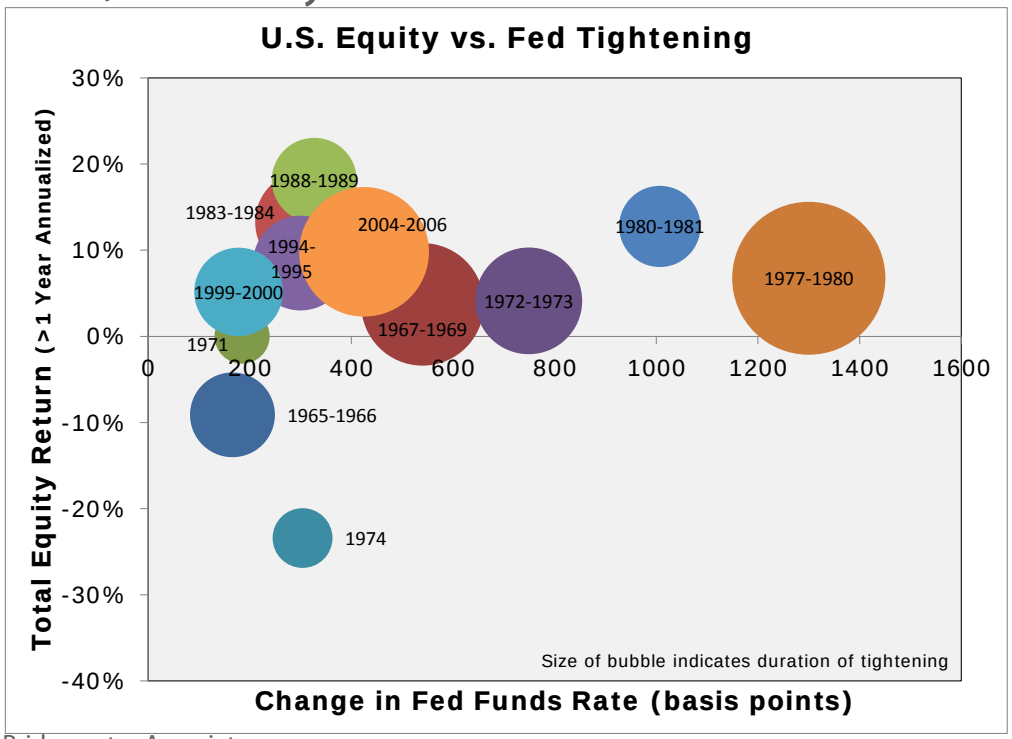


Data sources: Wilshire Atlas

Equity Returns and Fed Tightening

Wilshire

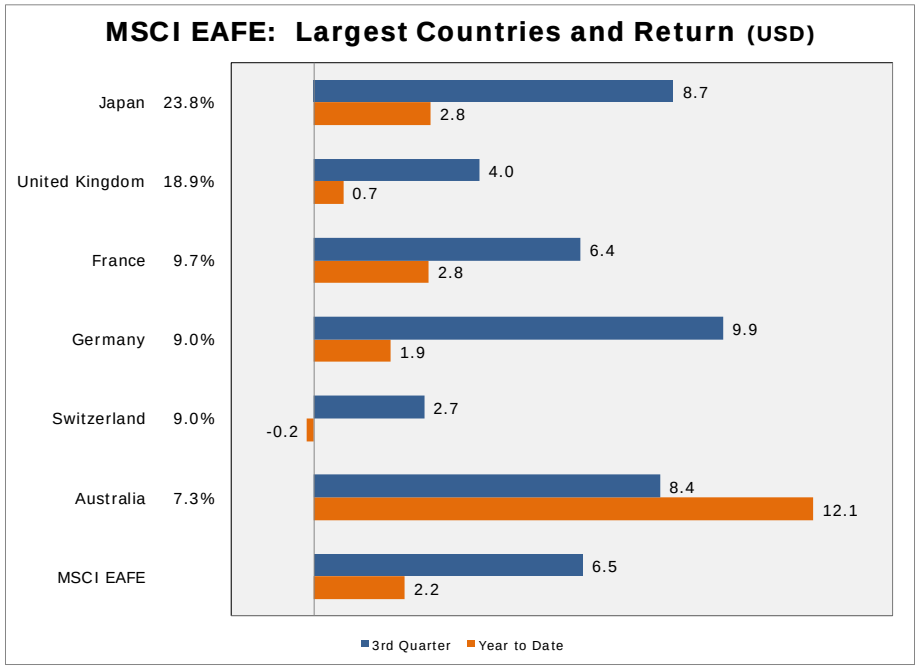
- In 12 tightening cycles of the past 50 years, equity prices have typically fared well
- What might be different today?
  - While in the past corporate earnings were improving before and through the average cycle, EPS is currently on the decline
  - Current cycle may have already started with quantitative easing discontinued
- Except for 2004-2006, recent cycles have been shorter than average

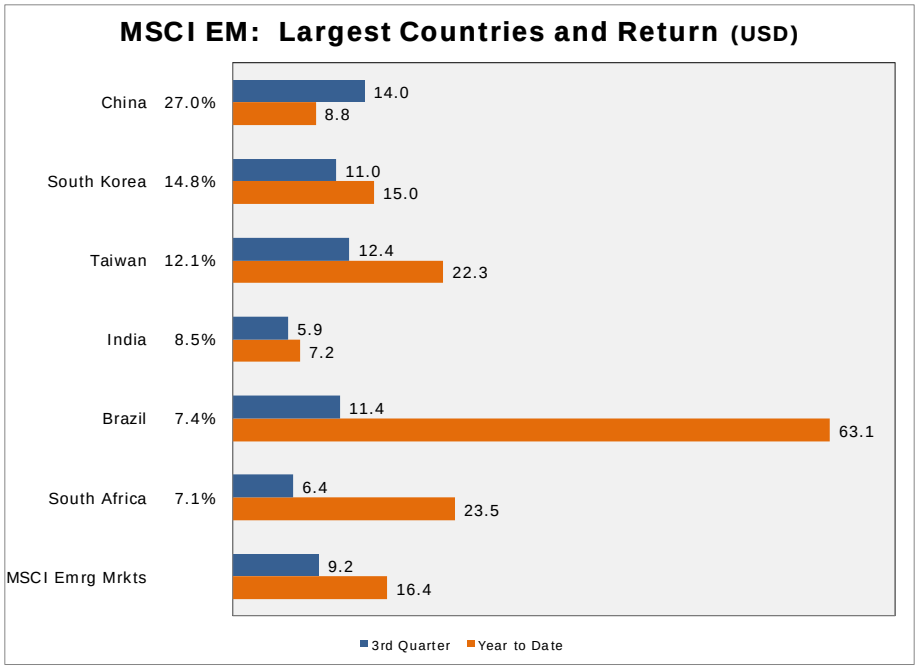


Source: Federal Reserve, Wilshire Compass, Bridgewater Associates

Non-U.S. Equity Market

September 30, 2016	Qtr	Ytd	1 Yr	3 Yr	5 Yr	10 Yr
MSCI ACWI ex-US ($g)	7.0	6.3	9.8	0.6	6.5	2.6
MSCI EAFE ($g)	6.5	2.2	7.1	0.9	7.9	2.3
MSCI Emerging Markets ($g)	9.2	16.4	17.2	-0.2	3.4	4.3
MSCI Frontier Markets ($g)	2.7	2.6	1.4	0.2	5.0	0.3
MSCI ACWI ex-US Growth ($g)	6.1	6.5	11.9	2.6	7.8	3.5
MSCI ACWI ex-US Value ($g)	7.9	6.0	7.6	-1.4	5.2	1.7
MSCI ACWI ex-US Small ($g)	8.5	8.5	14.3	4.0	9.1	5.0
MSCI EAFE Minimum Volatility Idx	2.2	5.4	11.9	7.1	9.9	6.0
FTSE RAFI Developed ex-US Index	7.8	3.4	7.0	0.0	7.0	2.6
MSCI EAFE LC (g)	6.1	-1.2	5.1	5.8	11.7	2.7
MSCI Emerging Markets LC (g)	7.7	11.6	13.4	4.7	7.3	6.3





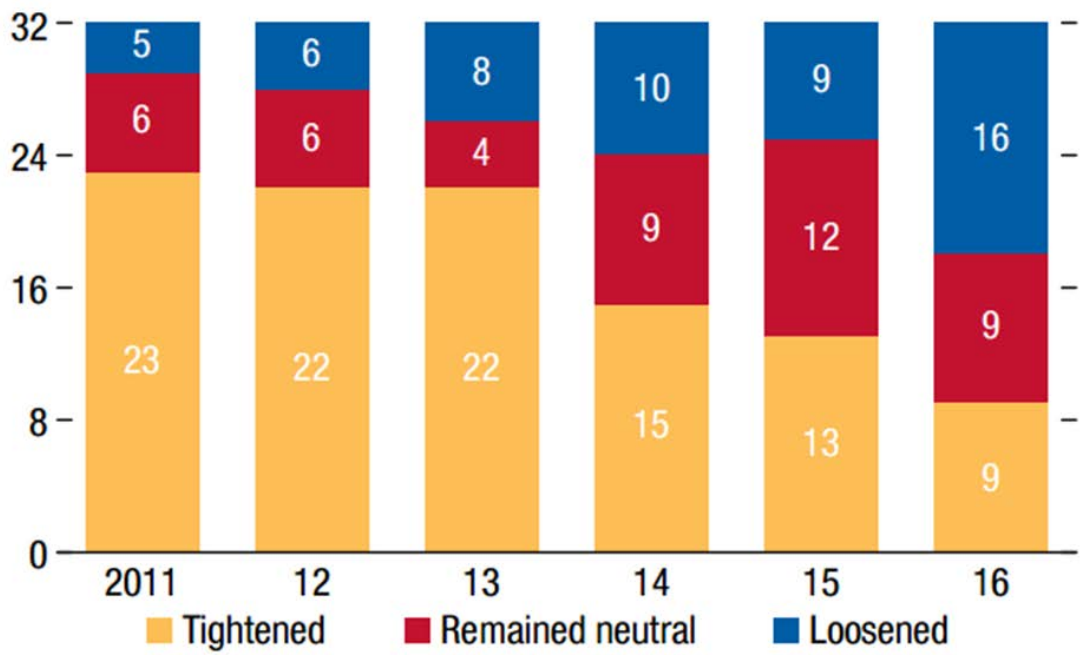
Data sources: Wilshire Compass

Global Fiscal Stimulus

Wilshire

- Governments in many countries are now leaning towards fiscal policy to stimulate growth
- China, Japan and Canada have been among the most aggressive so far
- Fiscal stimulus is a challenge within the Eurozone given their collective rules, such as overly indebted countries cannot run significant fiscal deficits

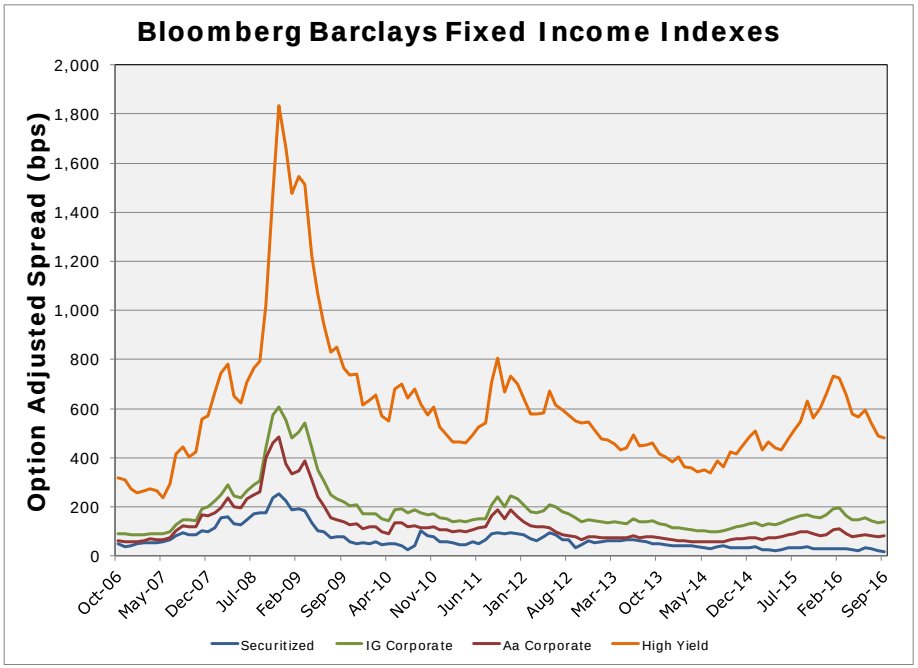
Number of developed countries in which the fiscal stance was tightened, loosened, or remained neutral

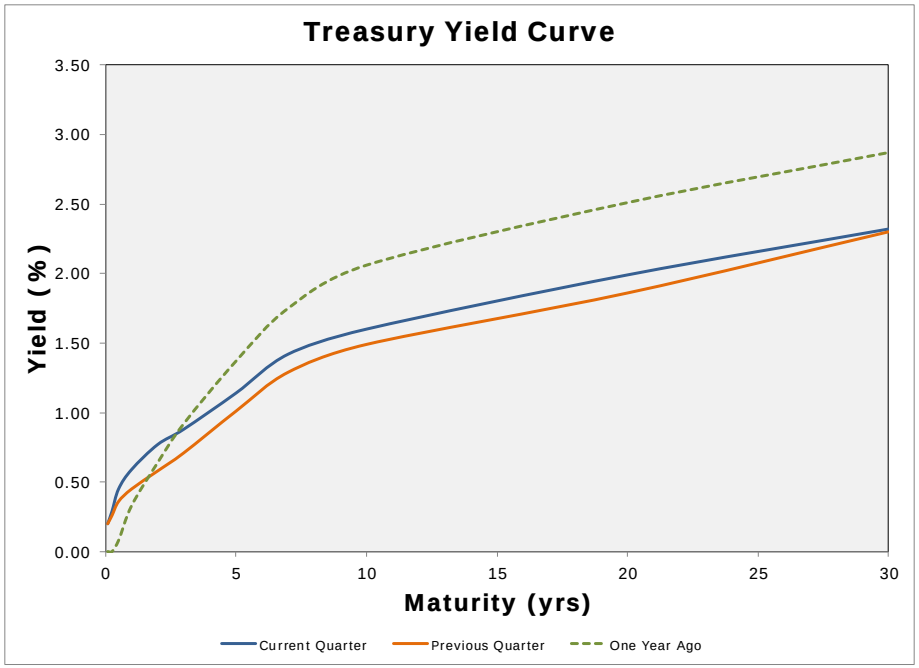


Source: International Monetary Fund

U.S. Fixed Income Market

September 30, 2016	YTM	Duration	Qtr	Ytd	1 Yr	3 Yr	5 Yr	10 Yr
Bloomberg Barclays Aggregate	2.0	5.5	0.5	5.8	5.2	4.0	3.1	4.8
Bloomberg Barclays Treasury	1.3	6.4	-0.3	5.1	4.1	3.4	2.2	4.5
Bloomberg Barclays Govt-Related	2.0	5.6	0.3	6.0	5.6	3.9	2.9	4.5
Bloomberg Barclays Securitized	2.1	2.7	0.6	3.9	3.7	3.6	2.8	4.6
Bloomberg Barclays Corporate IG	2.8	7.5	1.4	9.2	8.6	5.6	5.1	5.9
Bloomberg Barclays LT Govt/Credit	3.3	15.6	1.2	15.7	14.7	10.1	6.3	7.8
Bloomberg Barclays LT Treasury	2.2	18.2	-0.4	14.7	13.1	11.2	5.5	8.1
Bloomberg Barclays LT Govt-Rel.	3.8	12.7	0.9	14.6	14.9	9.4	6.3	7.7
Bloomberg Barclays LT Corp. IG	4.1	14.3	2.6	16.8	15.7	9.5	7.2	7.6
Bloomberg Barclays U.S. TIPS	0.2	8.6	1.0	7.3	6.6	2.4	1.9	4.5
Bloomberg Barclays High Yield	6.6	4.0	5.6	15.1	12.7	5.3	8.3	7.7
Treasury Bills	0.3	0.25	0.1	0.2	0.3	0.1	0.1	0.9





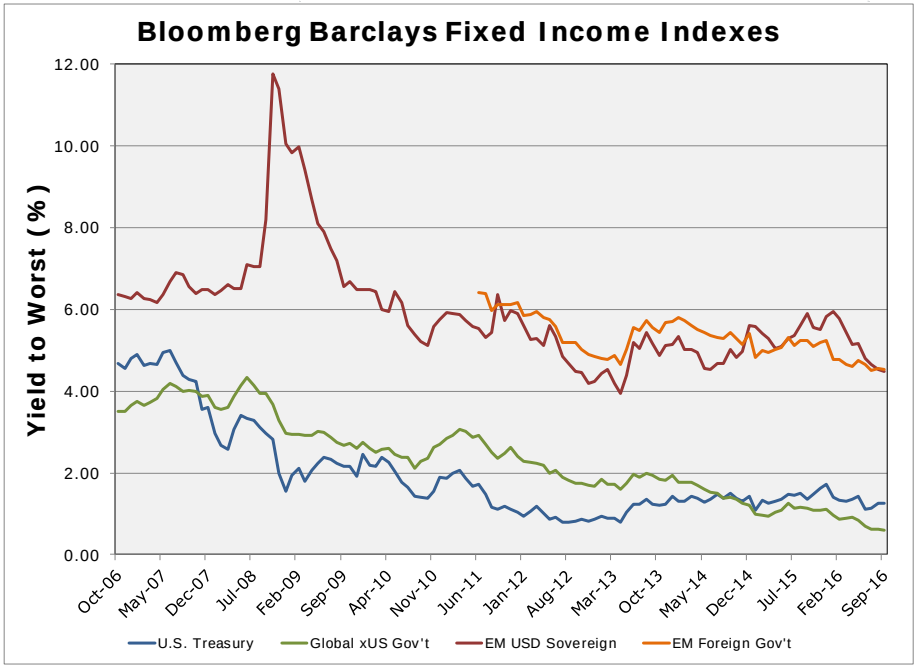
Data sources: Wilshire Compass, Bloomberg Barclays, U.S. Treasury

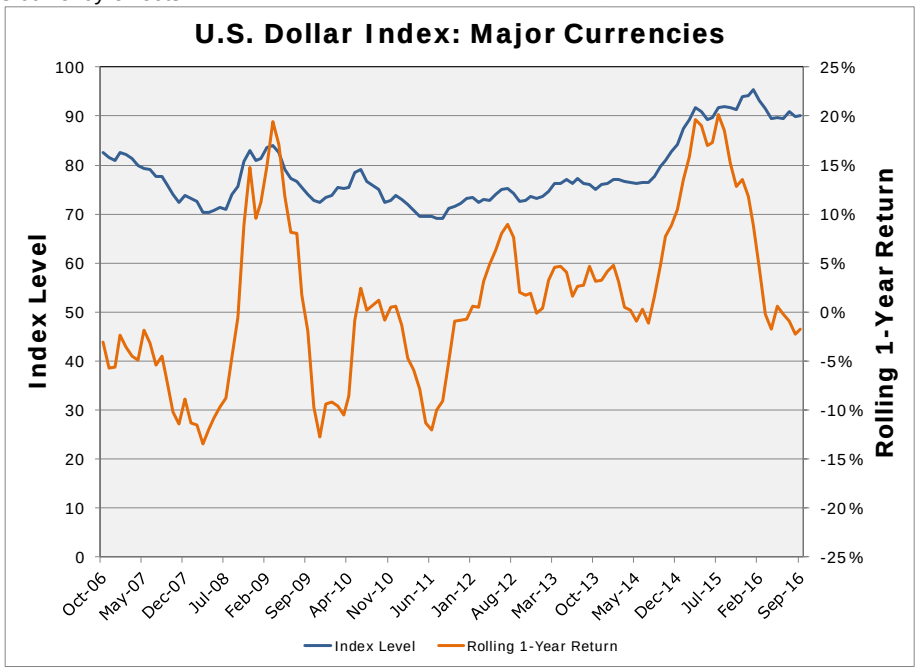
Non-U.S. Fixed Income Market

Wilshire

September 30, 2016	Qtr	Ytd	1 Yr	3 Yr	5 Yr	10 Yr
Developed Markets						
Bloomberg Barclays Global Aggregate xUS	1.0	13.1	11.7	0.8	0.7	3.8
Bloomberg Barclays Global Aggregate xUS *	0.5	6.9	7.5	5.8	5.0	4.7
Bloomberg Barclays Wrld Govt xUS IL Bond	4.7	11.5	7.5	2.6	3.2	4.2
Bloomberg Barclays Wrld Govt xUS IL Bond *	5.7	16.5	15.0	9.4	7.0	6.0
Emerging Mrkts (Hard Currency)						
Bloomberg Barclays EM USD Aggregate	3.1	12.8	13.9	6.6	7.3	7.4
Emerging Mrkts (Foreign Currency)						
Bloomberg Barclays EM Local Currency Gov't	3.1	14.5	15.7	0.1	2.4	n.a.
Bloomberg Barclays EM Local Currency Gov't *	1.0	6.2	6.7	3.5	3.2	n.a.
Euro vs. Dollar	1.2	3.5	0.7	-6.0	-3.5	-1.2
Yen vs. Dollar	1.3	18.8	18.3	-1.0	-5.3	1.5
Pound vs. Dollar	-2.8	-11.9	-14.2	-7.1	-3.6	-3.6

* Returns are reported in terms of local market investors, which removes currency effects.



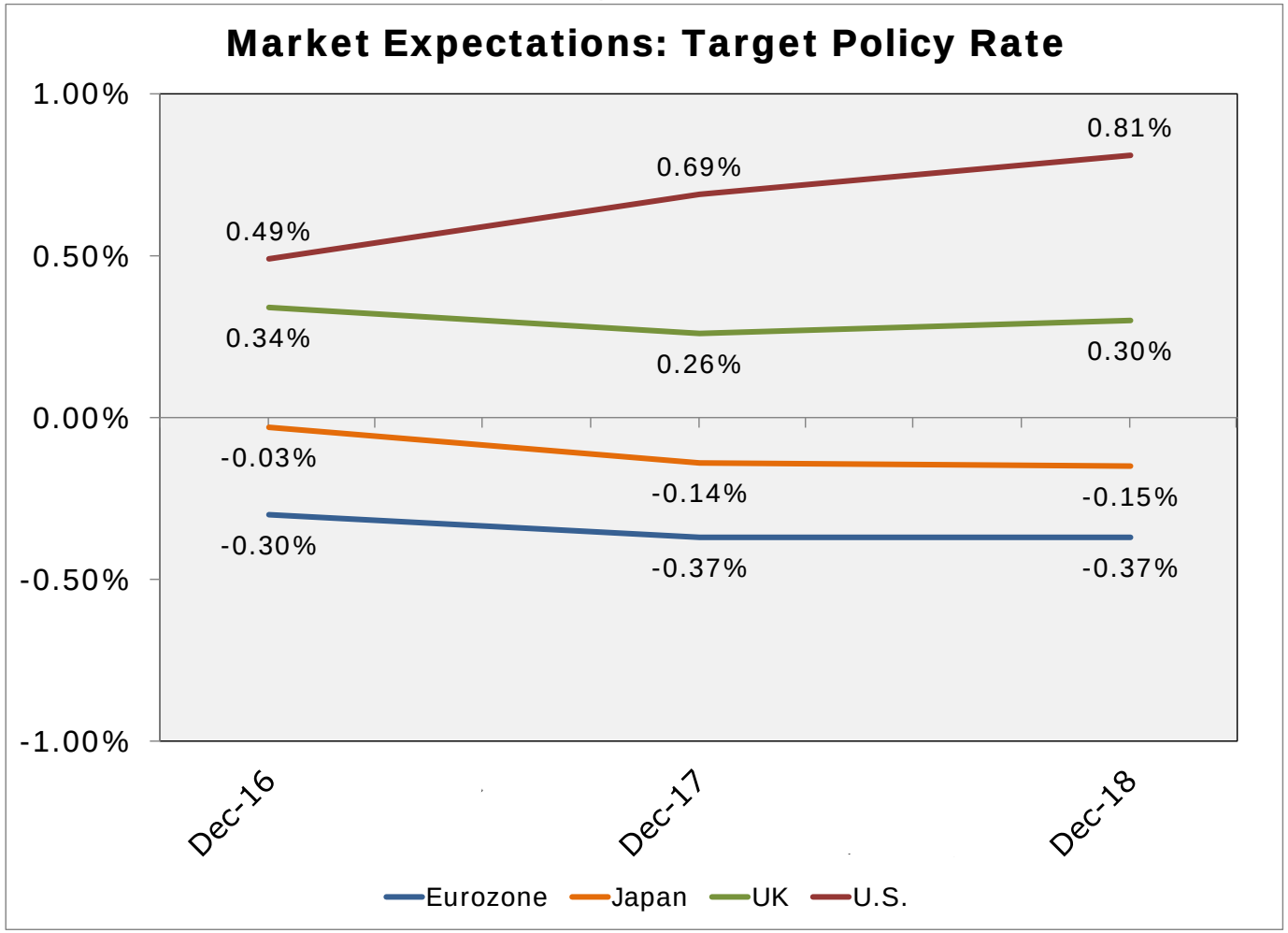


Data sources: Wilshire Compass, Bloomberg Barclays

Global Central Bank Expectations

Wilshire

- Market expectations for central bank activity are muted across the globe
- U.S. Federal Open Market Committee median expectation for year-end 2018 was 1.875% at their last meeting

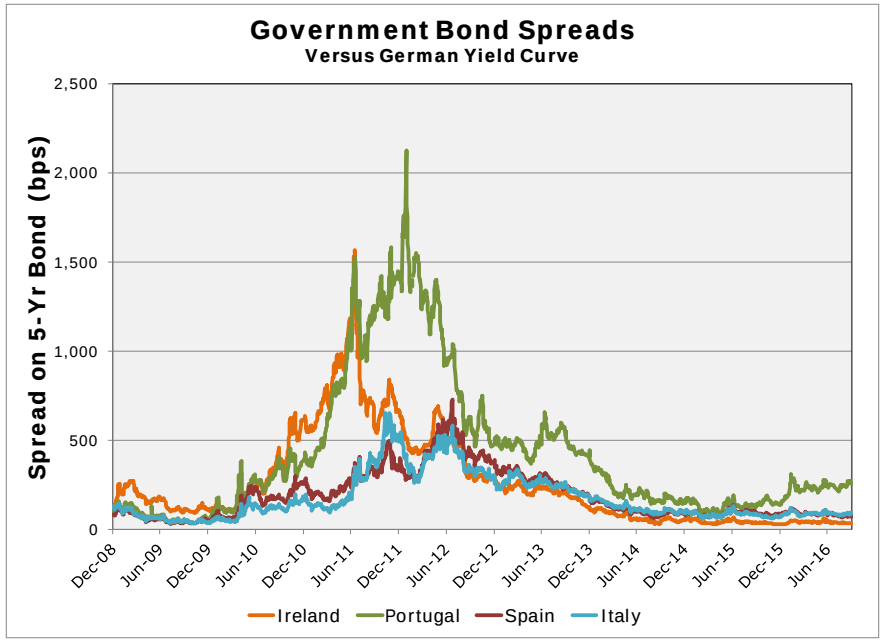


Source: J.P. Morgan Asset Management

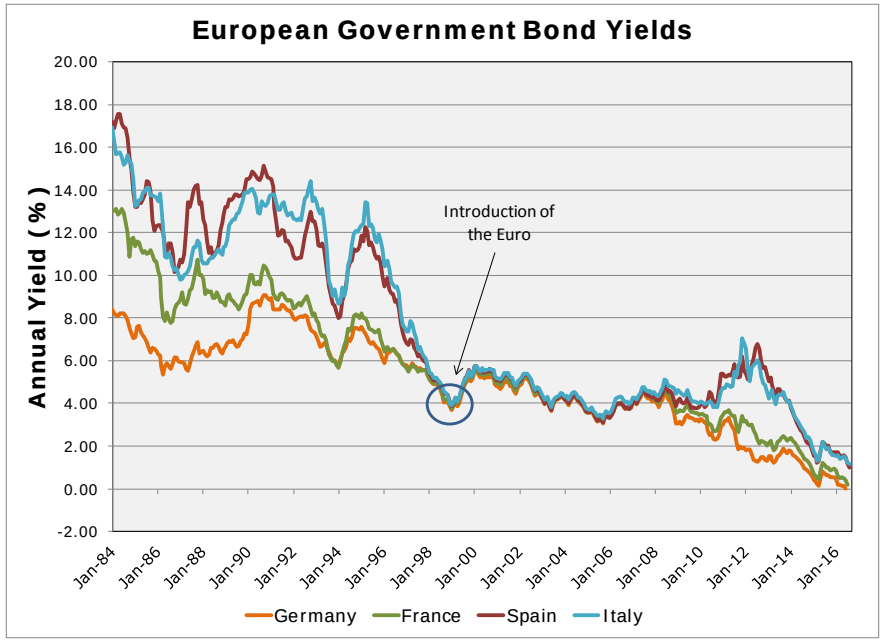
European Debt

Wilshire

- Spreads on Portugal's government debt have risen as the country faces the possibility of a downgrade, which would disqualify them from the European Central Bank's bond purchase program



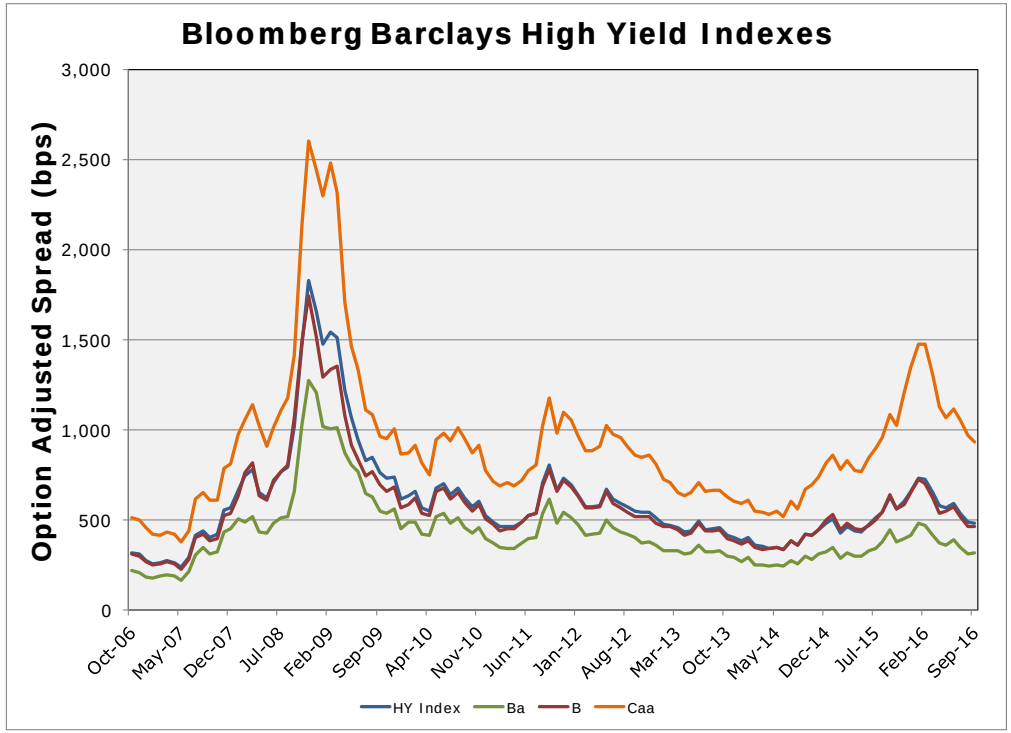
- Yields on government bonds are again falling after a brief uptick; Germany actually sold 10-year debt at a negative yield in July



Source: Bloomberg Barclays, International Monetary Fund

High Yield Bond Market

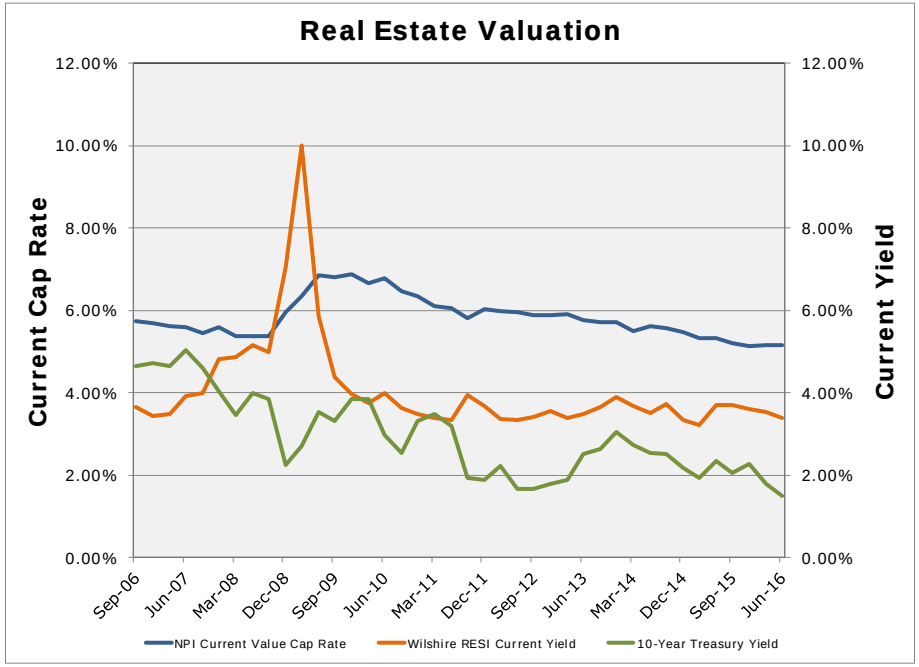
September 30, 2016	Weight	Qtr	Ytd	1 Yr	3 Yr	5 Yr	10 Yr
Bloomberg Barclays High Yield Idx	100%	5.6	15.1	12.7	5.3	8.3	7.7
Quality Distribution							
Ba U.S. High Yield	46.4%	4.4	12.3	12.1	6.5	8.3	8.2
B U.S. High Yield	38.3%	5.7	13.5	11.3	4.4	7.7	6.4
Caa U.S. High Yield	14.4%	8.2	25.5	16.1	4.4	9.8	6.9
Ca to D U.S. High Yield	0.8%	17.1	63.3	27.2	-21.6	-8.0	-2.4
Non-Rated U.S. High Yield	0.1%	-1.9	4.4	-7.5	-3.3	4.7	0.6

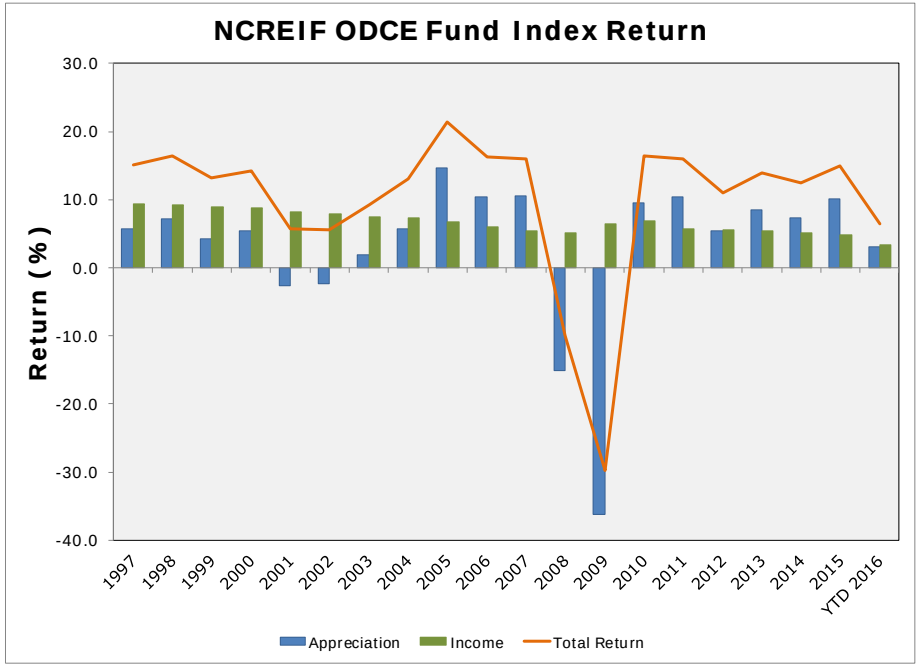


Data sources: Bloomberg Barclays

Real Assets

September 30, 2016	Qtr	Ytd	1 Yr	3 Yr	5 Yr	10 Yr
Barclays U.S. TIPS Index	1.0	7.3	6.6	2.4	1.9	4.5
Bloomberg Commodity Index	-3.9	8.9	-2.6	-12.3	-9.4	-5.3
Wilshire Global RESI Index	0.0	10.1	15.5	10.1	13.8	4.9
NCREIF ODCE Fund Index	2.1	6.5	10.1	12.4	12.4	6.0
NCREIF Timberland Index	0.7	1.4	3.3	7.6	6.9	6.4
Alerian MLP Index (Oil & Gas)	1.1	15.9	12.7	-4.8	5.0	9.0



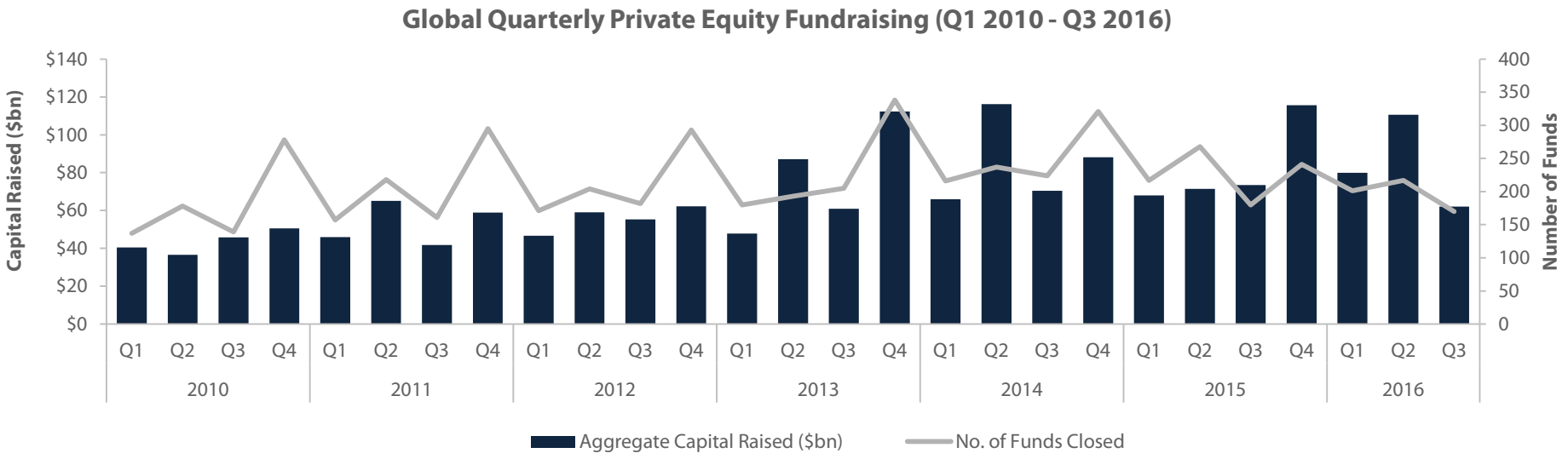


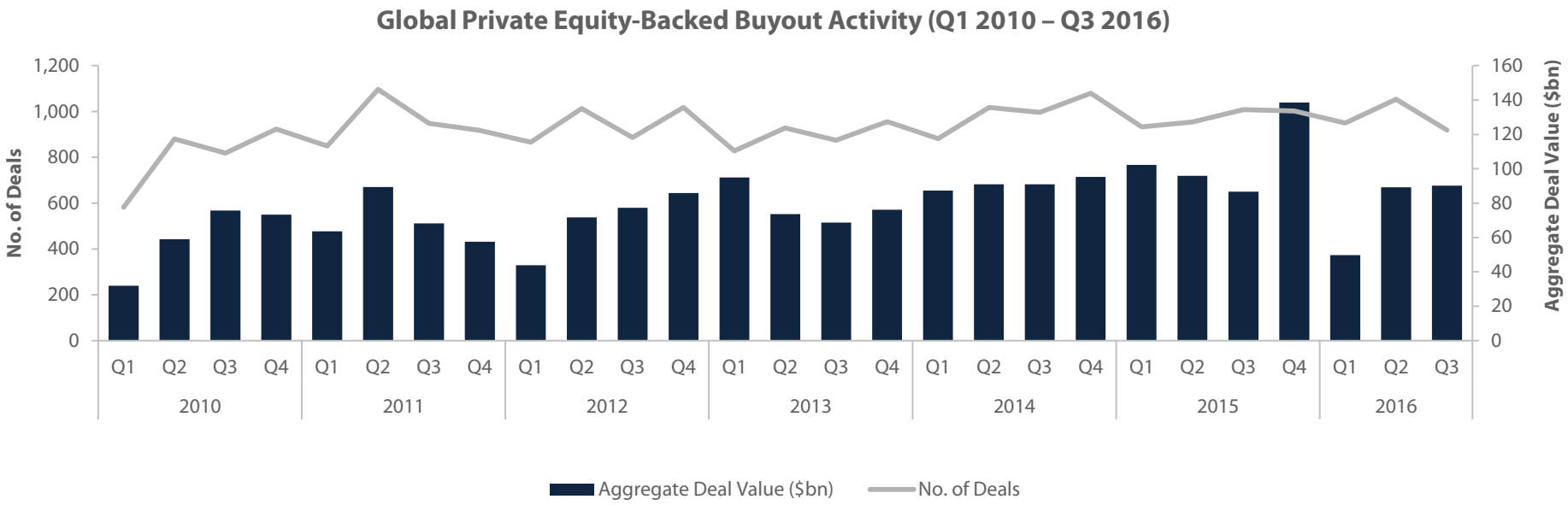
Data sources: Wilshire Compass, National Council of Real Estate Investment Fiduciaries

Appendix: Private Markets Update

Private Equity – Fundraising & Investment Activity

Wilshire

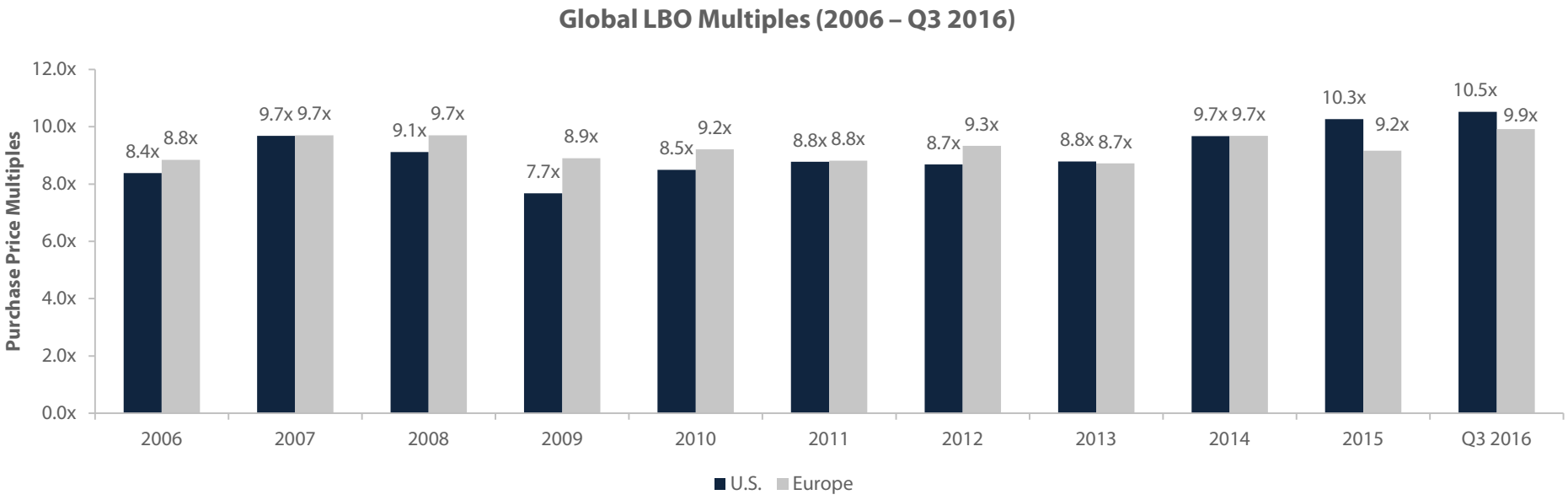


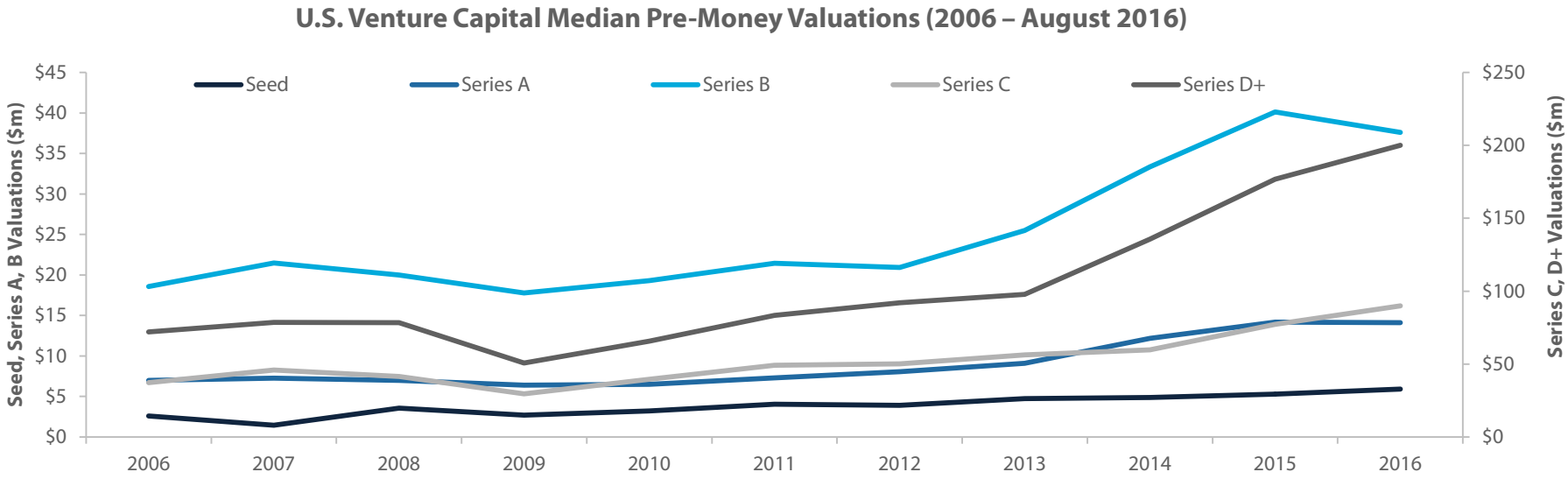


Source: Preqin, as of September 30, 2016.

Private Equity – Pricing & Valuations

Wilshire

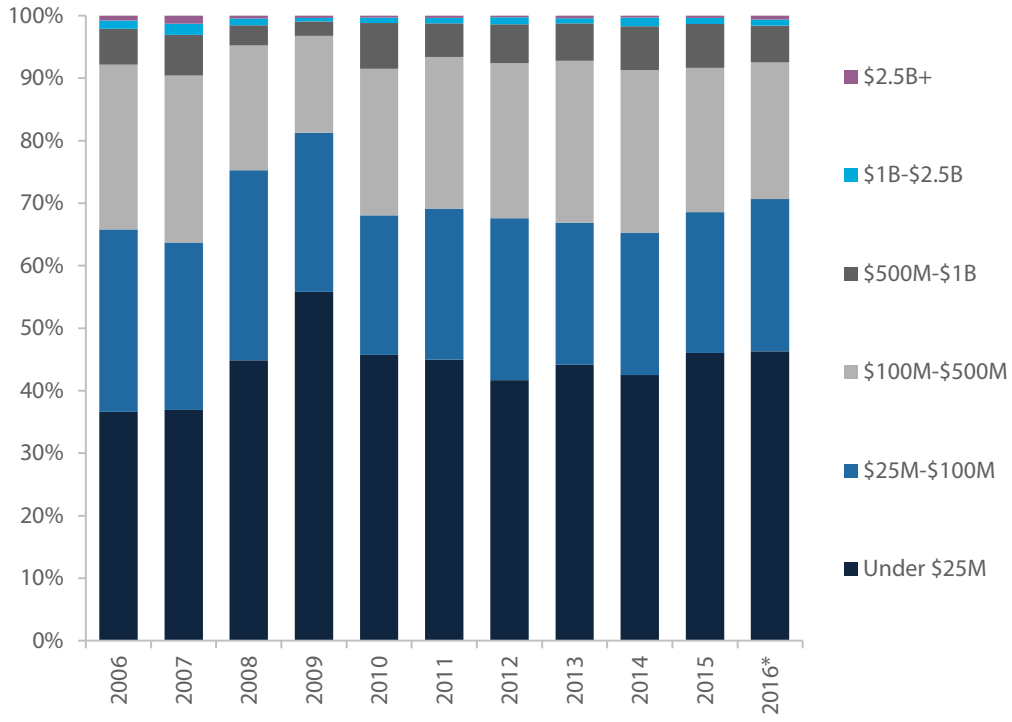


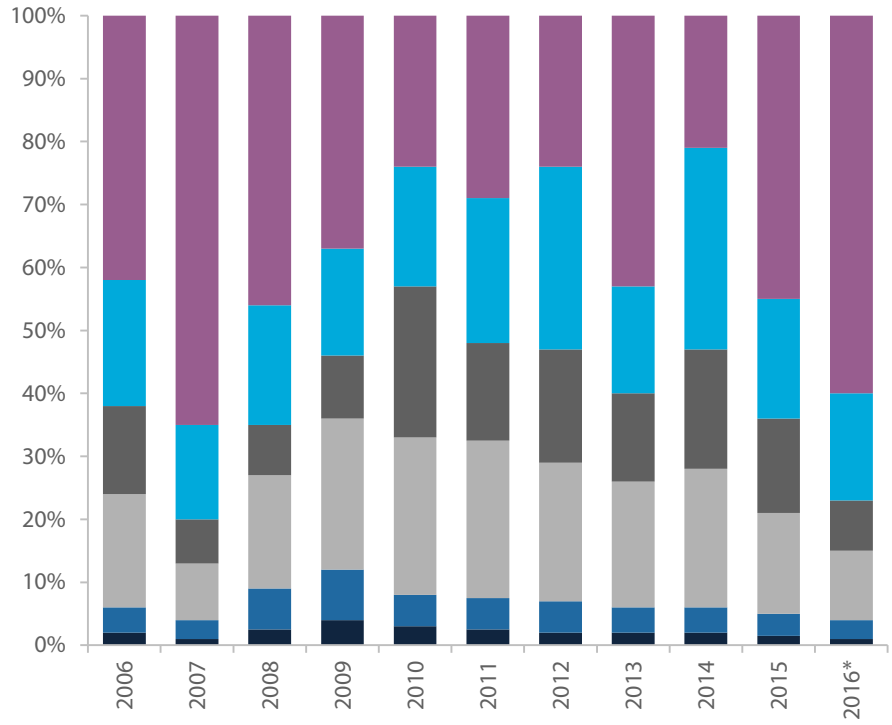


Sources: S&P LCD, through September 30, 2016; PitchBook, as of August 1, 2016.

Private Equity – U.S. Investment Activity by Deal Size

Wilshire



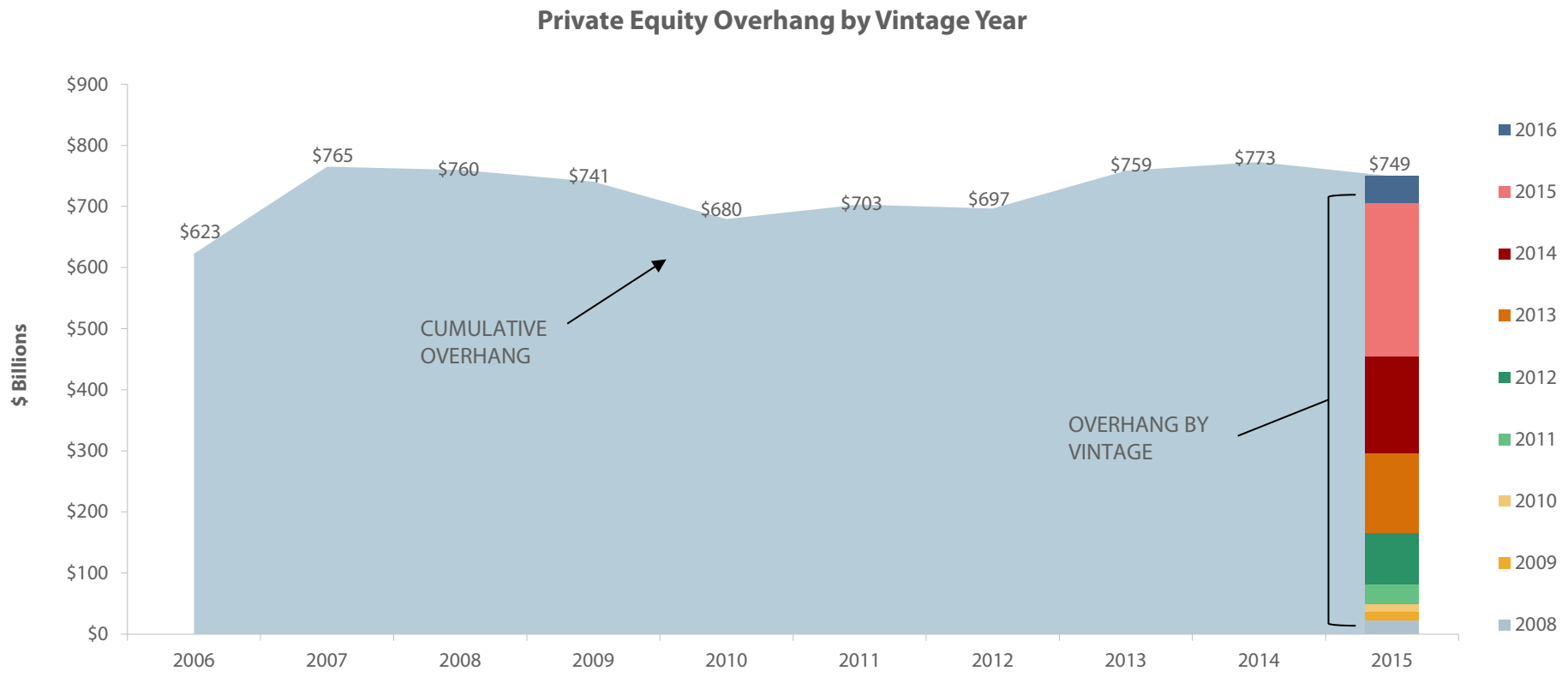


- Smaller deals continue to dominant deal activity by count
- Deals over $2.5 billion make up the majority of deal value in 2016

Source: PitchBook, *as of September 30, 2016.

Private Equity – Capital Overhang

Wilshire



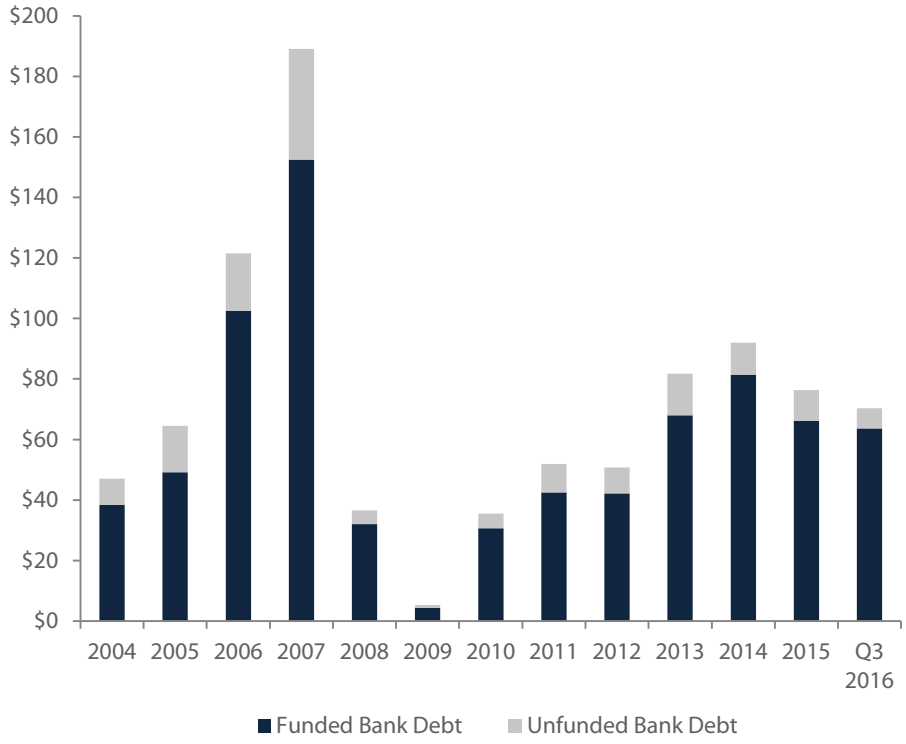
- As of December 31, 2015, aggregate private equity dry powder across North America and Europe remains elevated at $749 billion, a 3% decline from the end of 2014
- While the overhang slightly decreased across 2007 to 2010, the overhang has increased back to 2007-2008 peak levels

Source: PitchBook, as of December 31, 2015.

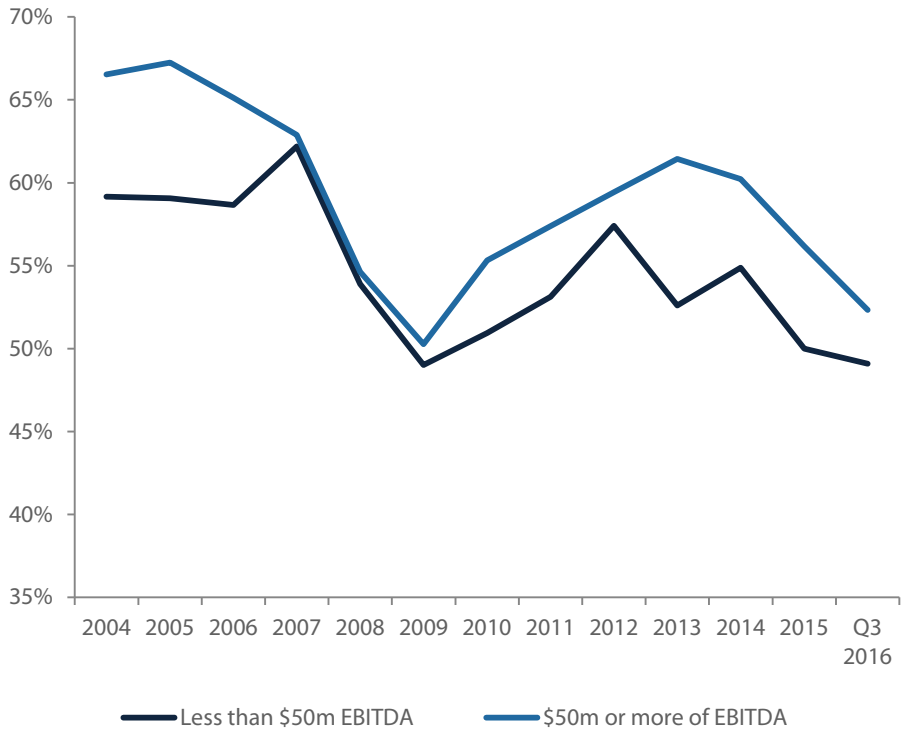
Private Equity – U.S. Debt Markets

Wilshire

Total U.S. Leveraged Buyout Loan Volume ($bn) (2004 – Q3 2016)



Percentage of Debt Used in Buyouts (2004 – Q3 2016)

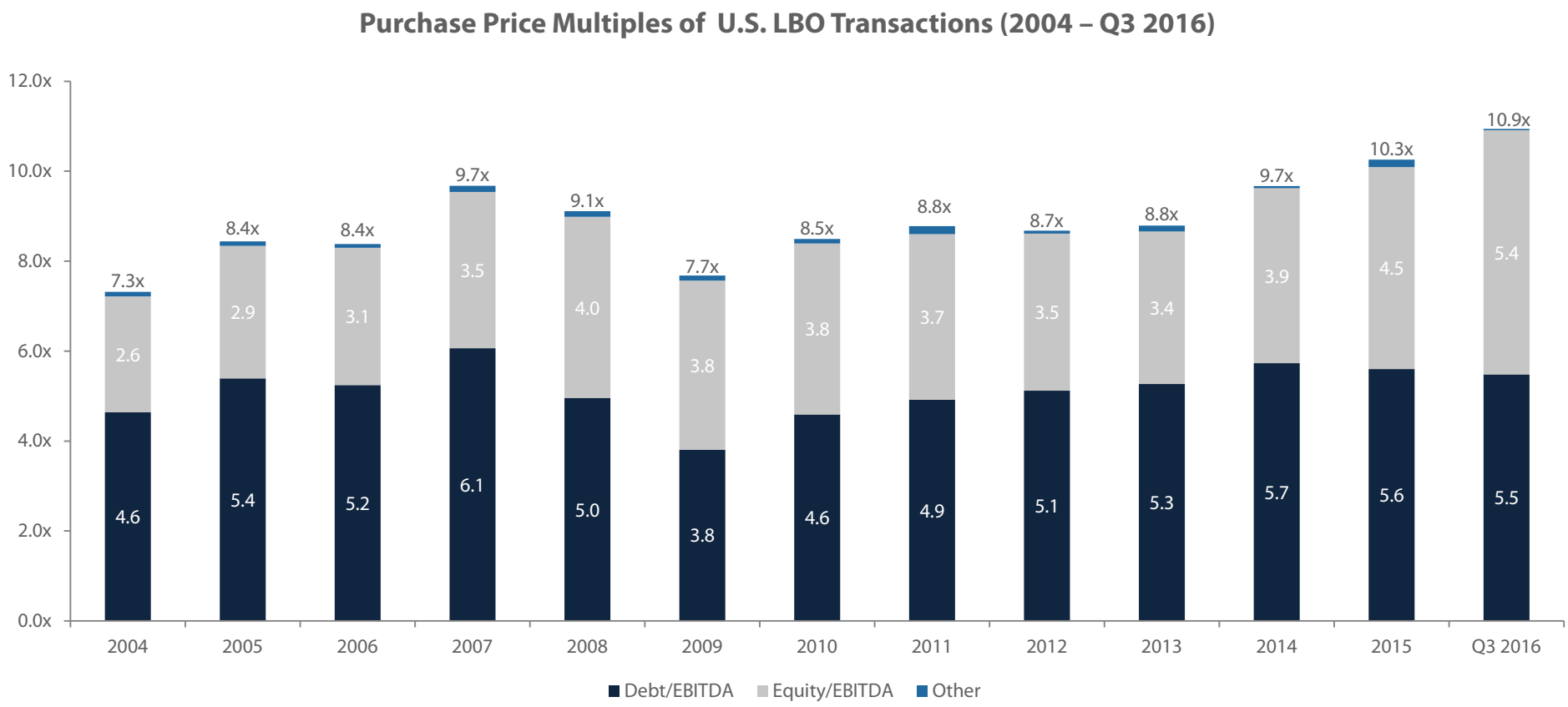


- The amount of capital available for leverage has decreased considerably since its peak volume in 2007; loan volume seems consistent in the last few years
- Historically, middle-market transactions apply less leverage than large-cap deals

Source: S&P LCD, as of September 30, 2016.

Private Equity – U.S. LBO Purchase Price Multiples

Wilshire

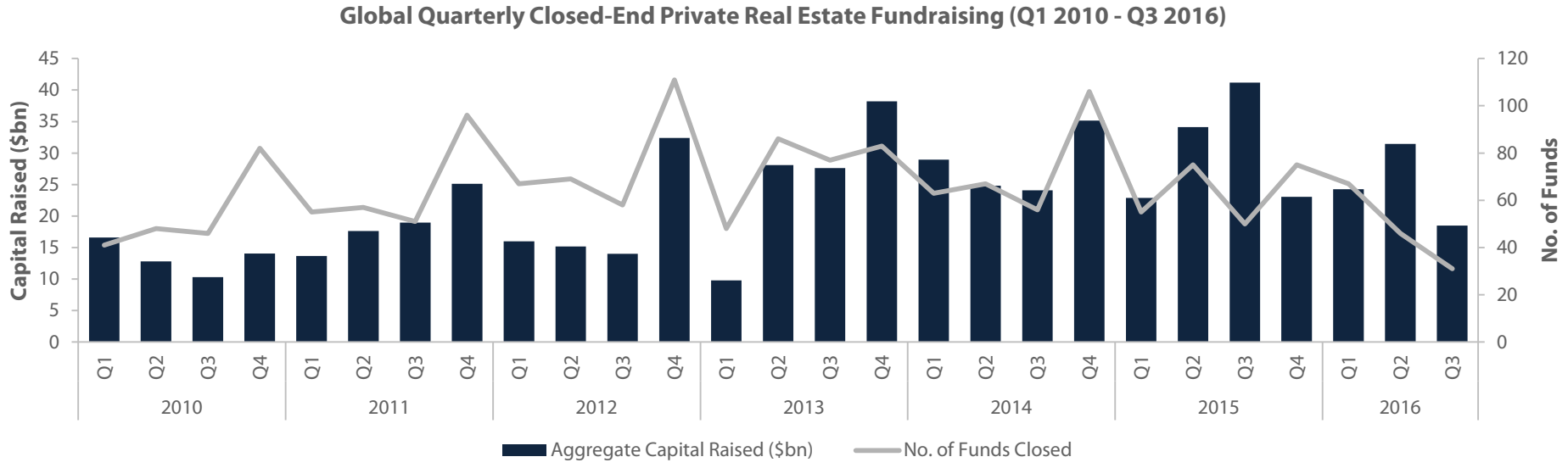


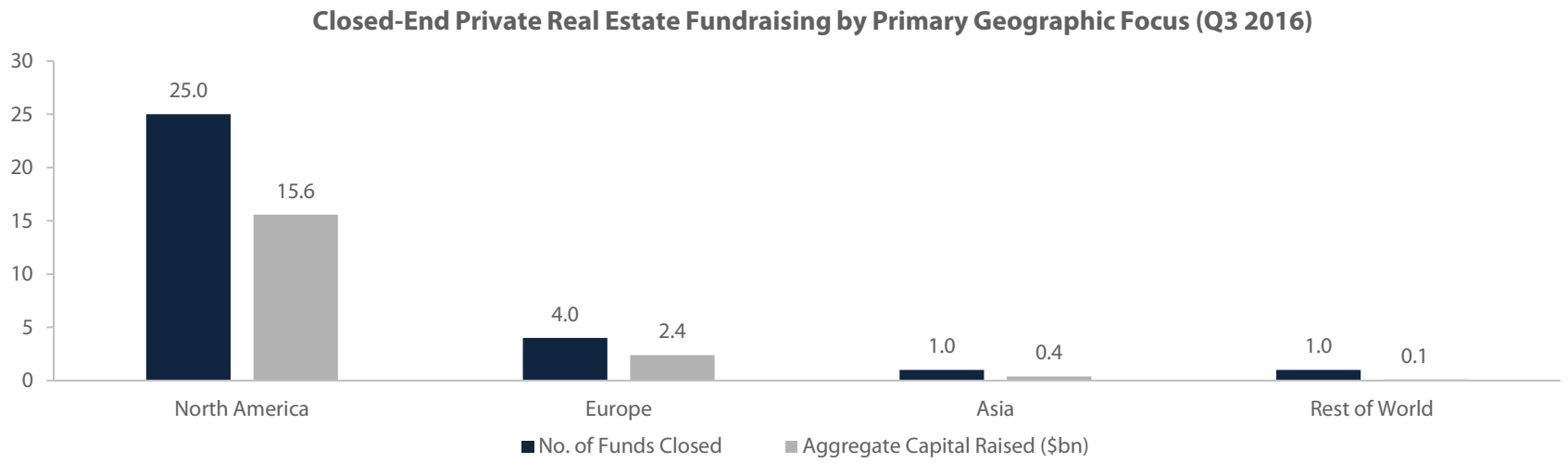
- As debt has become more readily available, purchase price multiples have increased from the low point in 2009
- Pricing in 2016 to date has increased by 0.6x from the recent high in 2015

Source: S&P LCD, as of September 30, 2016.

Private Real Estate – Fundraising Activity

Wilshire



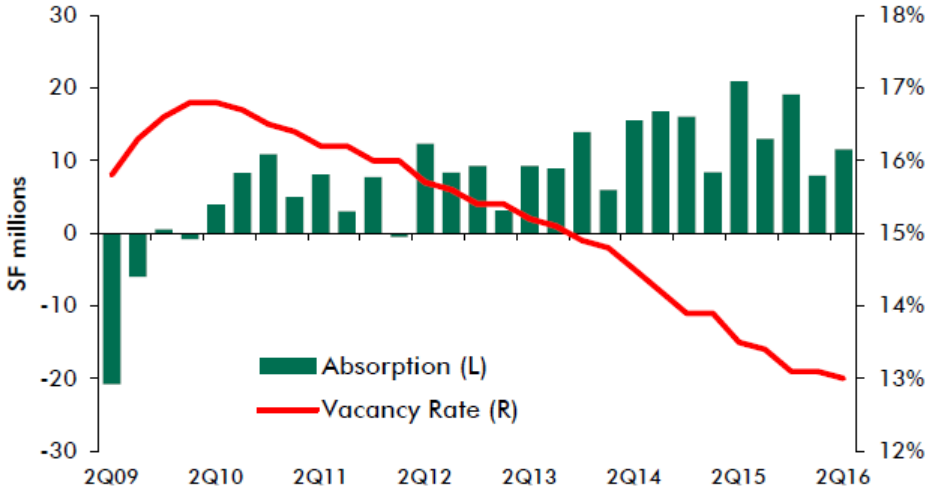


Source: Preqin, as of September 30, 2016.

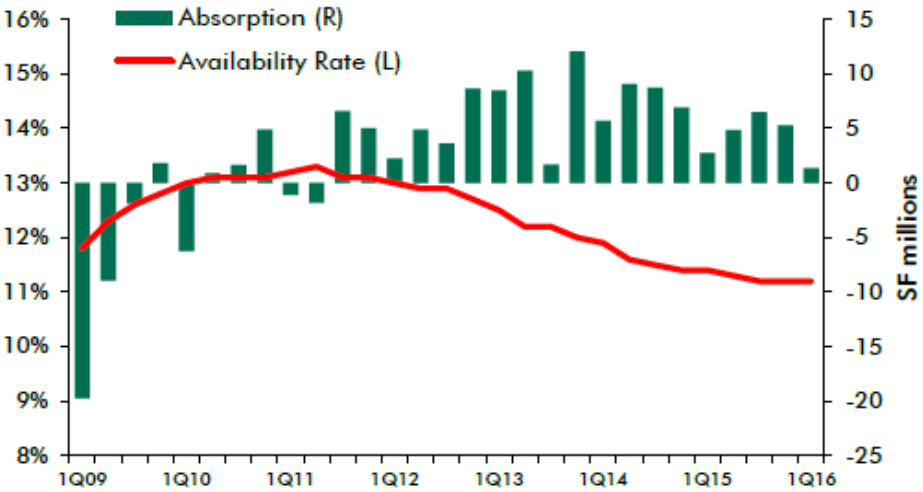
Commercial Property (as of Q2 2016)

Wilshire

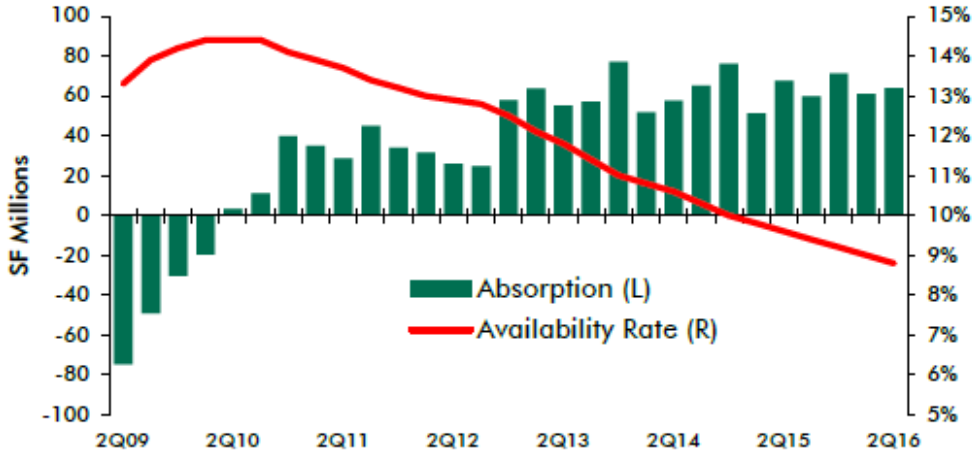
Office



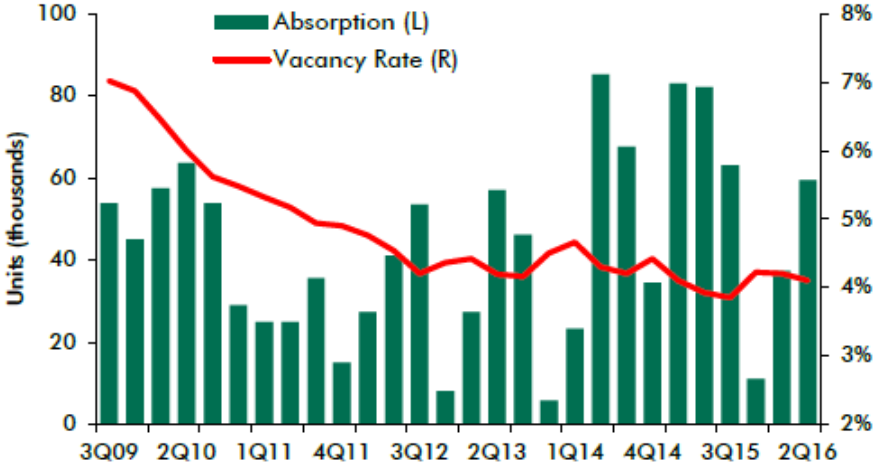
Retail



Industrial



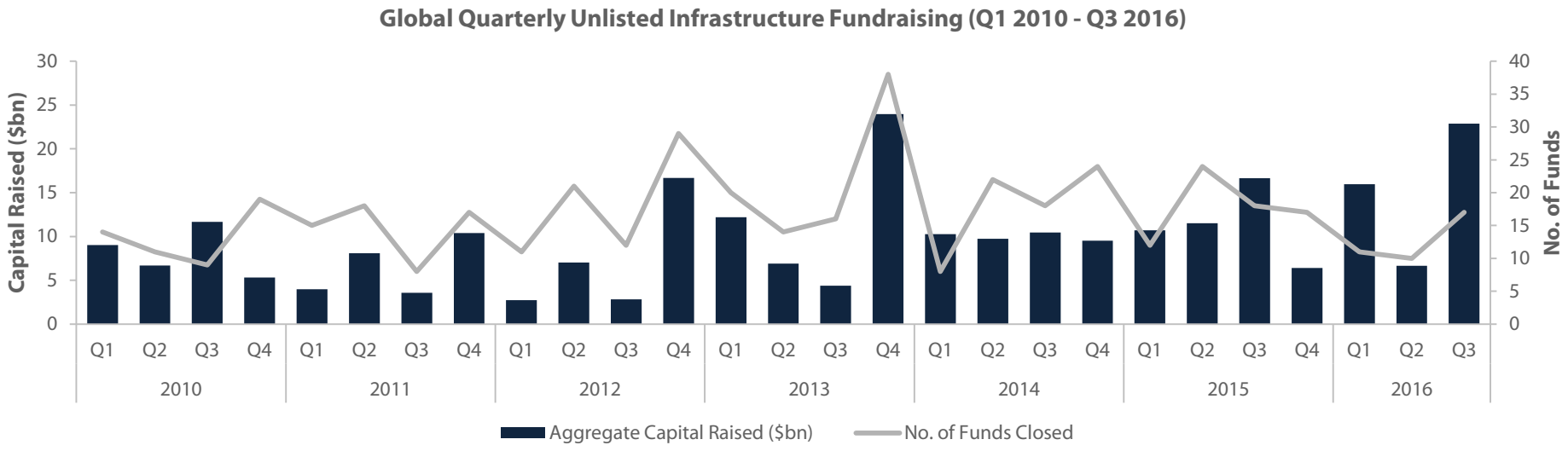
Apartment

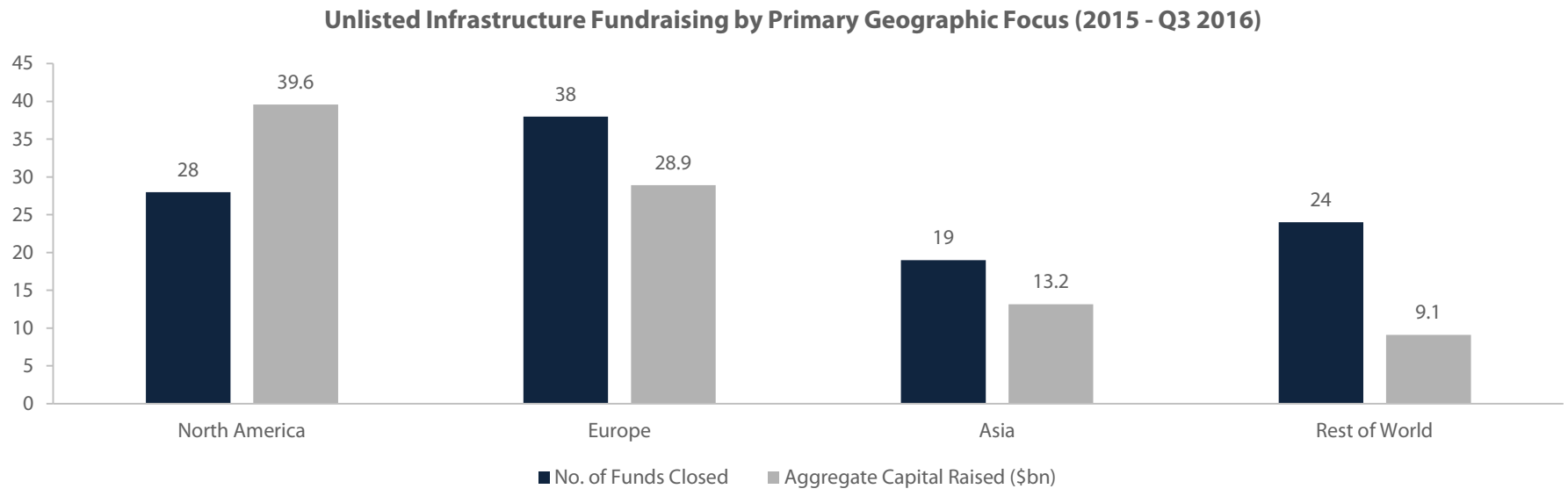


Source: CB Richard Ellis

Unlisted Infrastructure – Fundraising & Investment Activity

Wilshire

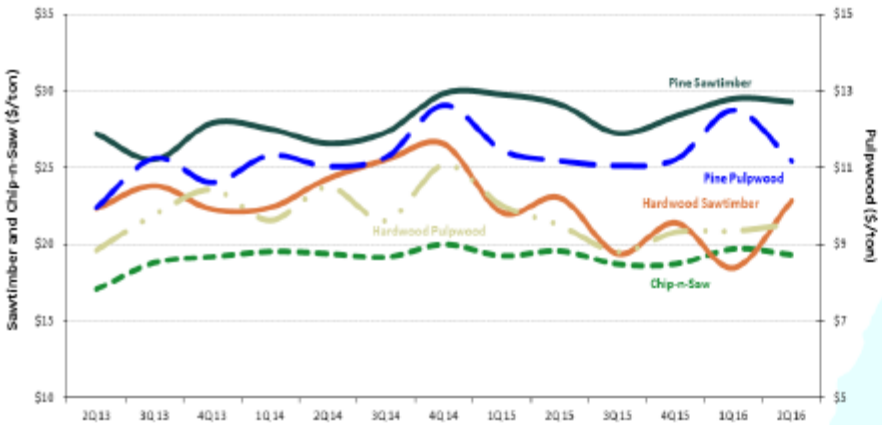




Source: Preqin, as of September 30, 2016.

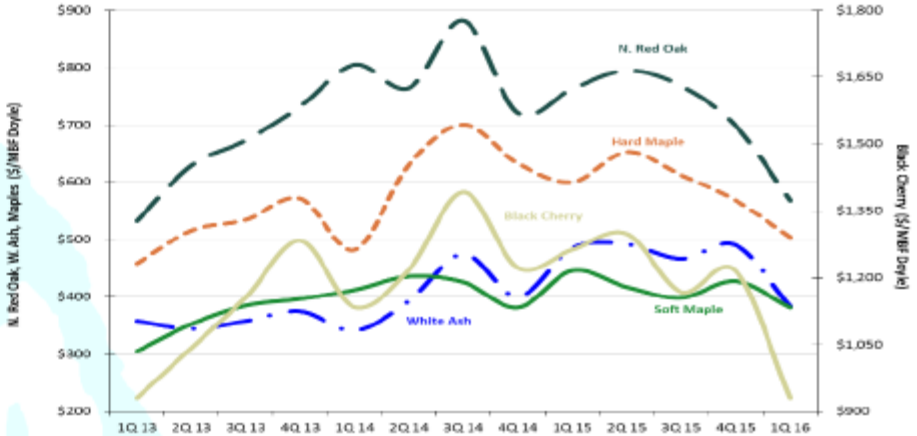
Timber

Southeastern Timber Prices



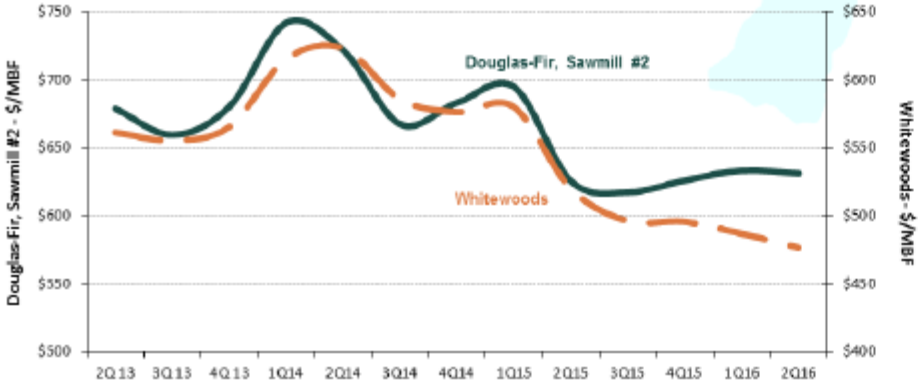
Source: Forest2Market®

Northeastern Hardwood Timber Prices



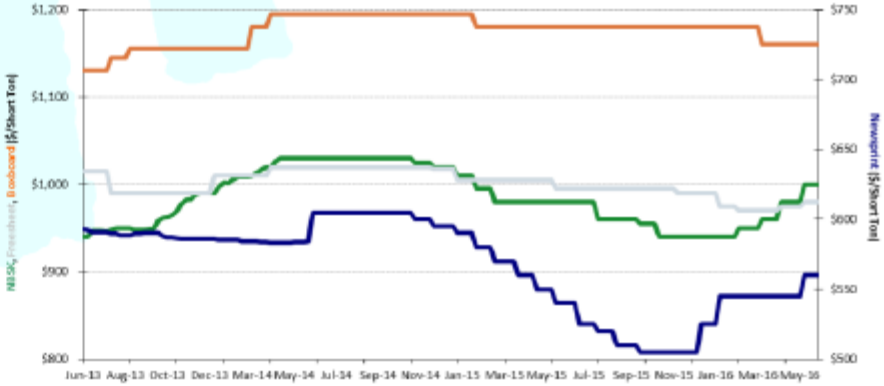
Source: Pennsylvania Woodlands Timber Market Report - Northwest Region

Pacific Northwest Timber Prices



Source: Log Lines®

Pulp and Paper

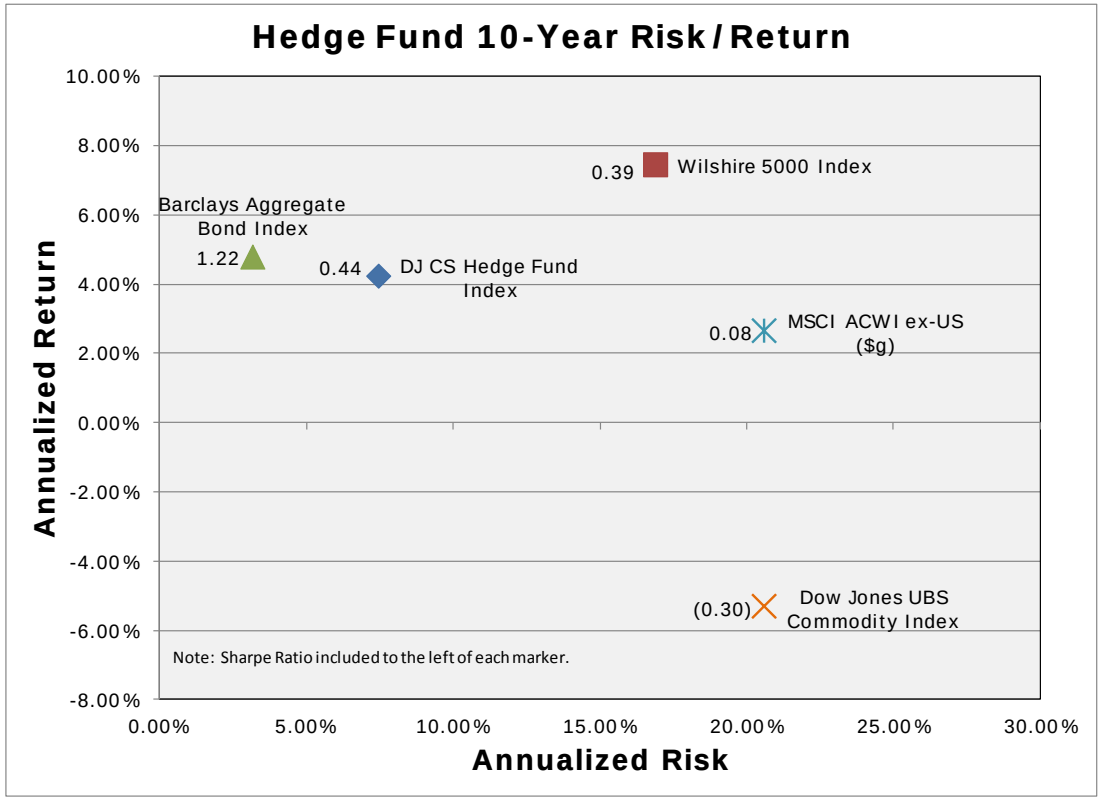


Source: FOEX Indexes, Ltd., RISI Pulp & Paper Week

Source: Forest Investment Associates

Hedge Fund Performance

September 30, 2016	Qtr	Ytd	1 Yr	3 Yr	5 Yr	10 Yr
DJ CS Hedge Fund Index	1.7	0.1	0.0	2.5	4.3	4.2
Event Driven Index	3.0	0.4	-1.9	0.1	4.2	4.0
Global Macro Index	0.6	-1.0	-0.4	1.7	2.3	5.7
Long/Short Equity Index	1.9	-3.2	-1.7	4.0	6.6	4.8
Multi-Strategy Index	2.6	3.2	3.7	5.9	7.3	5.7
Wilshire 5000	4.3	8.4	15.3	10.7	16.3	7.4
MSCI ACWI ex-US ($g)	7.0	6.3	9.8	0.6	6.5	2.6
Barclays Aggregate Bond Index	0.5	5.8	5.2	4.0	3.1	4.8
Dow Jones UBS Commodity Index	-3.9	8.9	-2.6	-12.3	-9.4	-5.3



Data sources: Wilshire Compass