NAIC National Association of Insurance Commissioners & The Center for Insurance Policy and Research

Capital Markets Special Report

The **NAIC's Capital Markets Bureau** monitors developments in the capital markets globally and analyzes their potential impact on the investment portfolios of US insurance companies. A list of archived Capital Markets Bureau Special Reports is available via the **index**

Interest Rate Impact on Fair Value of U.S. Insurer Investments

One of the concerns that comes from a prolonged low interest rate environment is the impact on the market/fair value of insurer investments when interest rates rise, especially if there is a spike in rates as opposed to a gradual increase. Increasing interest rates would have a negative impact on the fair value of an insurer's invested assets. Gradually increasing rates are unlikely to cause serious concern as insurers can reinvest cash flows in that environment. A spike in rates, however, may cause a more dramatic drop in fair value (FV) that would raise questions about appropriate valuations. At the same time, given the more gradual rollover of invested assets and traditional investment strategies of the insurance industry, insurers may have more difficulty competing with alternative asset managers. Nevertheless, given the current economic environment in the U.S. and globally, where no growth and even negative growth remain a concern, the potential for a sudden spike in interest rates is not a high-probability event.

This special report is an update to the NAIC Capital Markets Special Report titled "The Trajectory of Interest Rates and Its Impact on the Market Value of the U.S. Insurance Industry's Bond Portfolio," published in June 2013. The report focused on bond exposure and reviewed the then recent history of interest rates, described the term "bond bubble" and discussed the investment risk of higher interest rates. Interest rates are but one of several factors in FV determinations. Other factors include credit spreads, bond structure, duration and market volatility concerns. In this special report, we focus on the historical impact of rates on corporate and municipal bonds, the U.S. insurance industry's two largest bond categories. (See Table 1.)

Table 1: Year-End 2015 U.S. Insurance Industry Bond Exposure (BACV, $mil)

Bond Type	Life	P/C	Health	Fraternal	Title	Total	Percent of Total Bond Type
Corporate Bonds	$ 1,680,974	$ 332,132	$ 34,715	$ 66,629	$ 2,843	$ 2,117,293	54.2%
Municipal Bonds	176,753	342,927	20,016	8,325	1,335	549,357	14.1%
Agency-backed RMBS	183,925	75,668	11,761	9,276	235	280,866	7.2%
ABS and Other Structured Securities	215,876	51,413	4,372	2,812	34	274,508	7.0%
US Government	151,576	84,141	12,676	3,040	267	251,699	6.4%
Private-label CMBS	125,822	33,170	3,894	3,244	1	166,131	4.3%
Private-label RMBS	87,011	18,698	802	1,205	2	107,718	2.8%
Foreign Government	77,318	16,711	373	1,131	243	95,776	2.5%
Agency-backed CMBS	25,256	10,018	366	2,514	2	38,157	1.0%
Hybrid Securities	19,423	2,652	329	339	22	22,764	0.6%
Total:	$ 2,743,933	$ 967,532	$ 89,305	$ 98,515	$ 4,984	$ 3,904,269	100%
Percent of Total:	70.3%	24.8%	2.3%	2.5%	0.1%	100.0%	

SSAP No. 100—Fair Value Measurements defines FV as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants

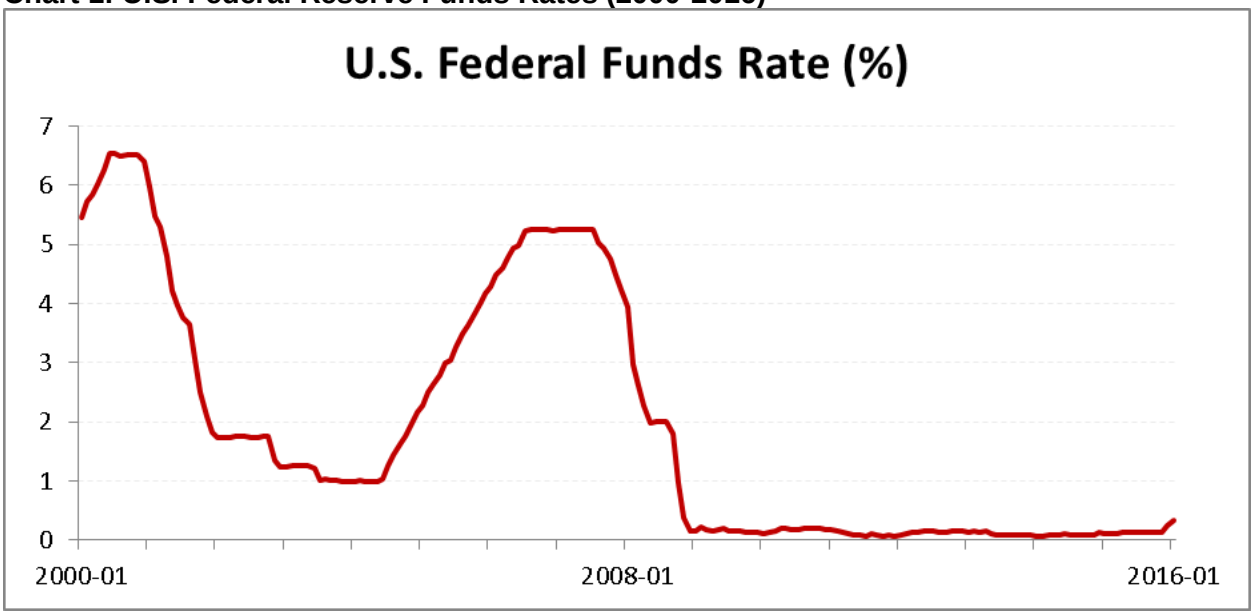
at the measurement date." For publicly traded securities, the FV is the price at which the security trades or, if no recent trading price is available, a price that appropriately reflects the latest bid and ask prices for the security. For debt securities that are not publicly traded, the FV is the discounted present value of the security calculated at a reasonable discount rate. For consistency and comparability in FV measurements and related disclosures, SSAP No. 100 provides detailed FV measurement instructions, including a three-level FV hierarchy that prioritizes inputs such that highest priority is given to quoted, unadjusted prices for assets in active markets (i.e., Level 1) and lowest priority is given to unobservable inputs (i.e., Level 3).
As of year-end 2015, U.S. insurers had exposure to bonds with a book/adjusted carrying value (BACV) of $3.9 trillion. Life companies held 70.3% ($2.7 trillion) of this total bond exposure, followed by P/C companies with 24.8% ($969.6 billion). As of year-end 2015, about 72% of life companies' total cash and invested assets were bonds, whereas for P/C companies, bond exposure accounted for 56% of their investments. Within bonds, corporate bonds are generally the largest for all insurer types except P/C companies, whose largest bond exposure is typically in municipals. Corporate bonds comprised 54% ($2.1 trillion) of the total bond exposure for all U.S. insurers, followed by municipal bonds at 14% ($550.7 billion). In addition, exposure to asset-backed securities (ABS), residential mortgage-backed securities (RMBS) and commercial mortgage-backed securities (CMBS) represented an aggregate 7% of total bond exposure as of year-end 2015.
While the discussion in this report focuses on the FV of bonds, most insurers report and carry the vast majority of assets at amortized cost, with some exceptions. For insurers that maintain an Asset Valuation Reserve (AVR), bonds are reported at amortized cost, except for bonds designated NAIC-6, in which case the bonds are reported at the lower of amortized cost or fair value. For insurers that do not maintain an AVR, bonds that are designated NAIC-1 or NAIC-2 are reported at amortized cost with bonds designated NAIC-3 to NAIC-6 reported at the lower of amortized cost or fair value. Therefore, the FV fluctuations discussed here do not affect what is reported for assets reported at amortized cost on balance sheets of the insurers.

Interest Rate Trends

Traditionally, central banks have adjusted interest rates charged between banks (i.e., the federal funds rate or Fed Funds) or between the U.S. Federal Reserve Bank (Fed) and banks (discount rate) to encourage or discourage lending. Lowering rates encourages bank lending, while raising rates discourages bank lending. The Fed and central banks abroad have cut their discount rate to, or near, zero with the onset of the financial crisis. With discount rates at or close to zero, in 2009 the Fed announced the initiation of economic stimulus through quantitative easing (QE). Under QE, the Fed purchased bonds from banks adding cash to their balance sheets, thus increasing bank reserves by the same amount. Stronger balance sheets enable banks to replace the securities sold or make new loans. The cycle of Fed purchases inducing bank purchases has the effect of pushing down longer-term yields and interest rates on fixed income securities.
While the Fed sets the discount rate and the target for the fed funds rate, they do not have direct influence on yields of market instruments. The Federal Open Market Committee (FOMC, the rate-setting body of the Fed) does establish policy for the Fed's activities in the marketplace that can have an indirect influence on market based yields through purchases and sales of Treasuries and other market instruments. A recent example of this was Operation Twist when the Fed bought significant amounts of longer dated bonds to lower longer yields. Other than that activity, long-term rates and yields are set by the equilibrium price established by the market. The market is influenced by expectations of future interest rates, as well as factors such as economic growth and inflation.
As shown in Chart 1, the fed funds rate fell to 0.16% in December 2008 from 5.25% in June 2007. In December 2015, the FOMC increased the fed funds rate by 0.25%. The December 2015 rate hike was widely anticipated given Fed communications leading up to that meeting. As

of January 2016, fed funds stood at 0.34%. Following the March 2016 FOMC meeting, the Fed indicated a pull-back from the previous forecast of a series of four rate hikes in 2016 down to two possible fed funds increases. Of course, as rates increase, we expect bond prices to decrease because of the inverse relationship of rate/yield to price.

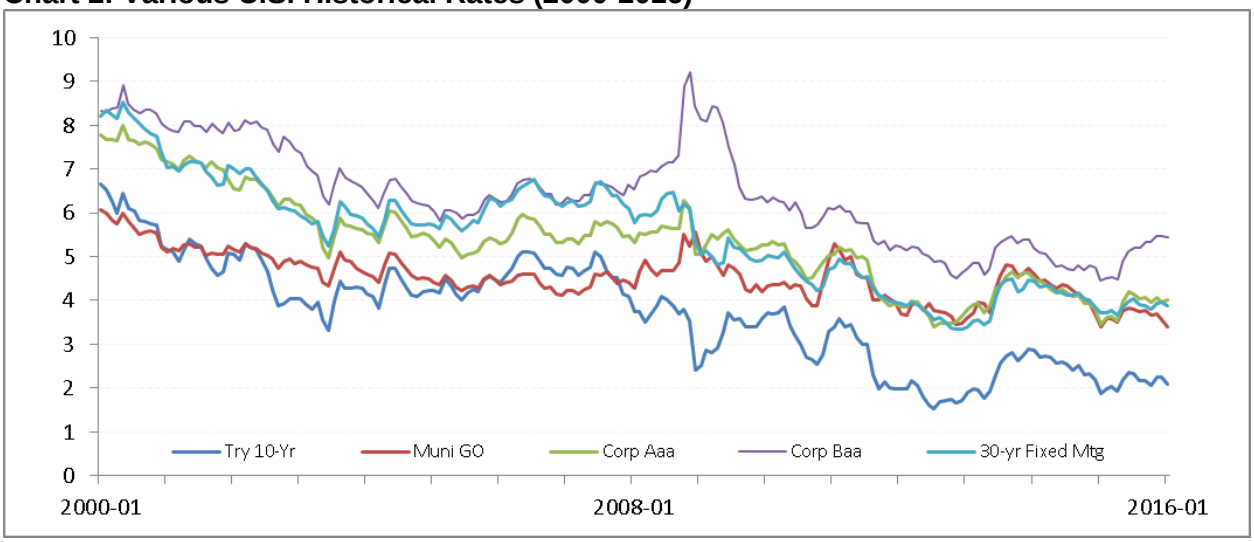
Chart 1: U.S. Federal Reserve Funds Rates (2000-2016)



Source: Federal Reserve

Chart 2 shows that a near-zero fed funds rate, along with QE, had the expected effect of driving down yields on bonds. The spike in rates for lower rated investment grade corporate bonds (i.e., Corp Baa) in 2008 graphically depicts the sharp move to less risky assets (flight to quality) that occurred due to the onset of the financial crisis. The shift in yields on below investment grade bonds was even more dramatic. Of course, as investor demand increased for U.S. Treasuries, thus pushing up their prices, the rate on U.S. Treasuries subsequently decreased.

Chart 2: Various U.S. Historical Rates (2000-2016)



Source: Federal Reserve; 30-yr Fixed Mtg represents the residential mortgage rate.

The Dow Jones Corporate Bond Index, an index of 96 recently issued investment grade corporate bonds, followed a similar path to the price of the U.S. 10-Year Treasury note, except for the more pronounced bounce from the index's 2008 low of 86.2% of par to the January 2015

high of 123.6%. In late 2015, market expectations of increasing interest rates caused a pullback in bond prices from their 2015 peak. Chart 3 shows the performance of the Dow Jones Corporate Bond Index since the beginning of 2000, compared to the yield of the 10-year Treasury. (Bond prices and yields have an inverse relationship, meaning that when bond prices rise, bond yields fall.)

Chart 3: U.S. Treasury 10-Year Yield and Dow Jones Corporate Bond Index Price Value History (2000-2016)

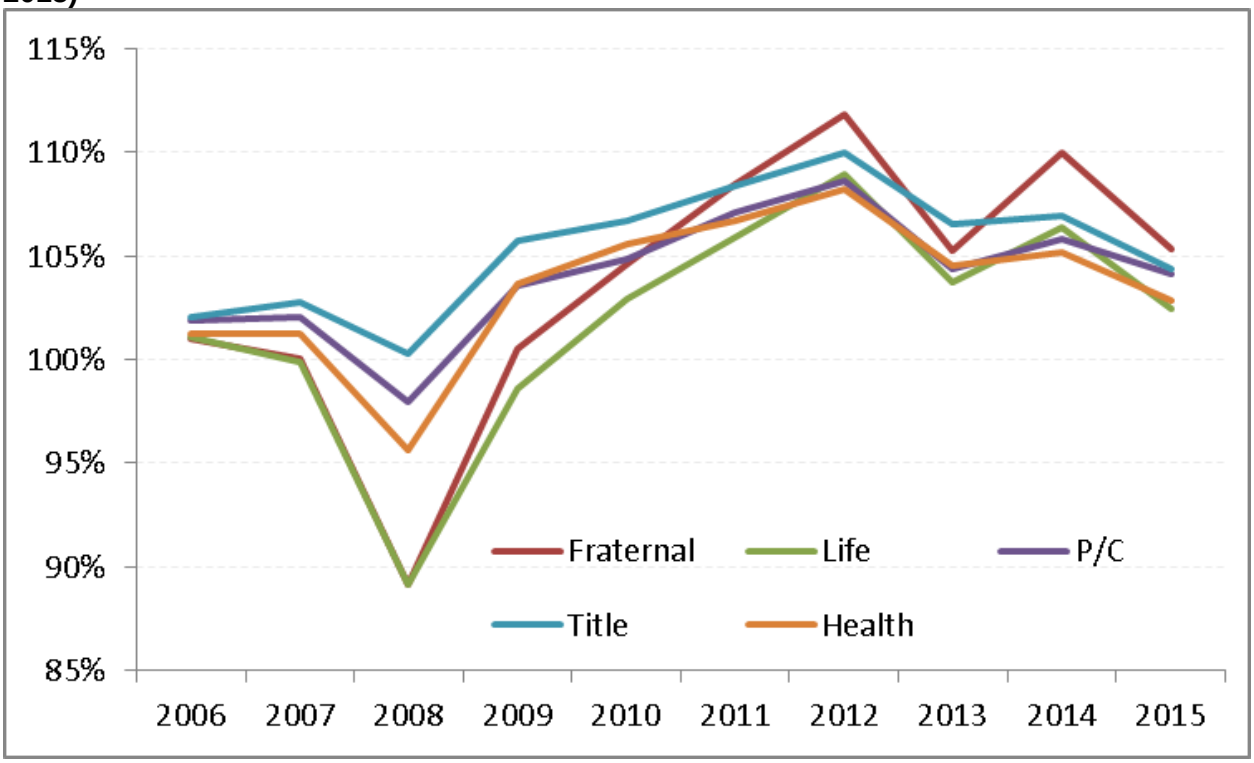
Source: Federal Reserve

Fair Value of U.S. Insurer Bond Exposure

The impact of interest rates on a bond's price is partly dependent on the duration of the bond. Duration is the magnitude of a bond's price change for a given change in interest rates. Longer duration bonds are more sensitive (and, therefore, the price more volatile) to changes in interest rates. The price/yield curve represents the relationship between the price and yield of a bond. (Recall there is an inverse relationship between the yield and price of a bond: As the yield increases, the price decreases.) A bond will exhibit negative convexity if the bond has a prepayment option. Under negative convexity, the inverse relationship still holds, but the change in price from a decrease in yield is less than predicted, while the change in price from an increase in yield is greater than predicted.

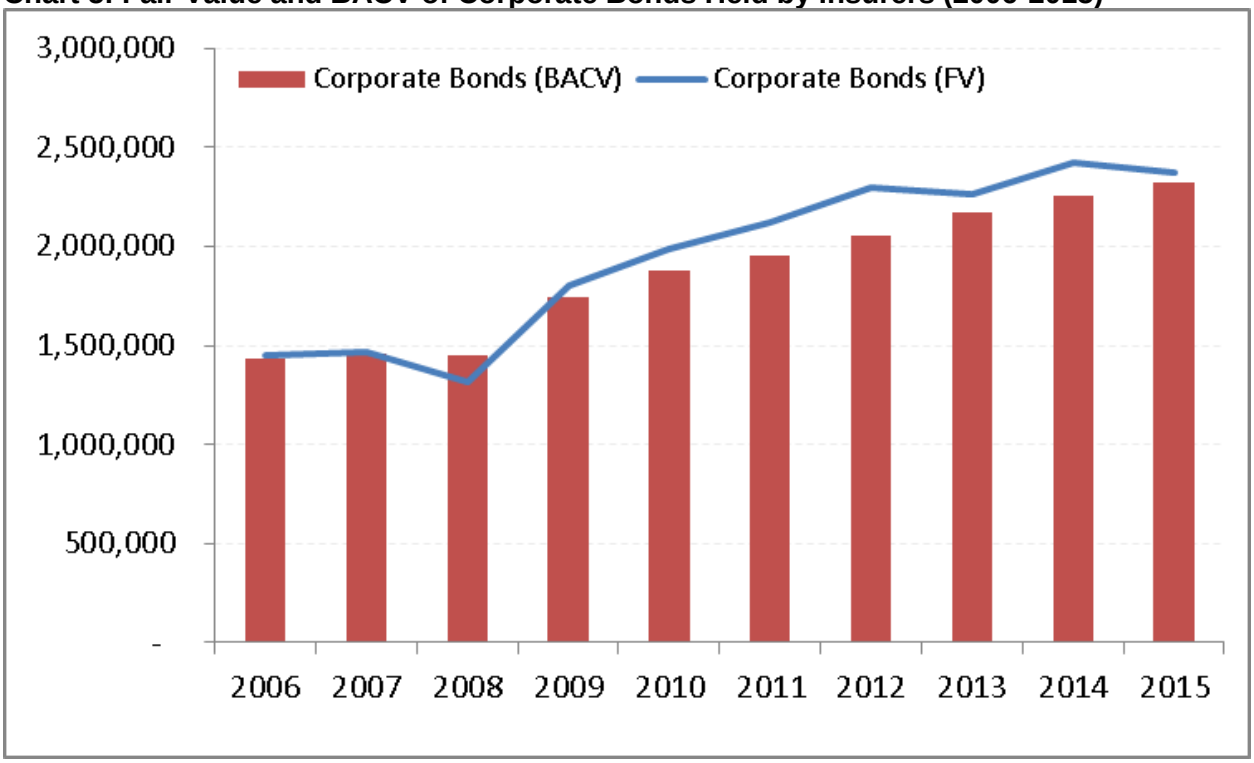
U.S. insurers are required to report FV, although in most cases, because the asset is carried at amortized cost, BACV is unaffected. Based on reported U.S. insurer data, the average FV of all bonds held by life insurers was 102% of par as of year-end 2015, whereas P/C and title insurers' bonds had a FV of 104% of par, health companies bonds' FV was at 103%, and fraternal companies reported the highest average FV to par among the insurers at 105%. (See Chart 4.) As previously noted, yields on U.S. Treasuries are only one component in the determination of FV, with credit spreads being another. For example, in early 2016 when credit spreads widened more than the Treasury yield declined, the net result was little or no change in bond prices. On the other hand, credit spreads on below investment grade bonds tend to be less sensitive to interest rates and more sensitive to expectations of earnings growth.

Chart 4: Average Fair Value (as a Percentage of Par) of All Bonds Held by Insurers(2006-2015)



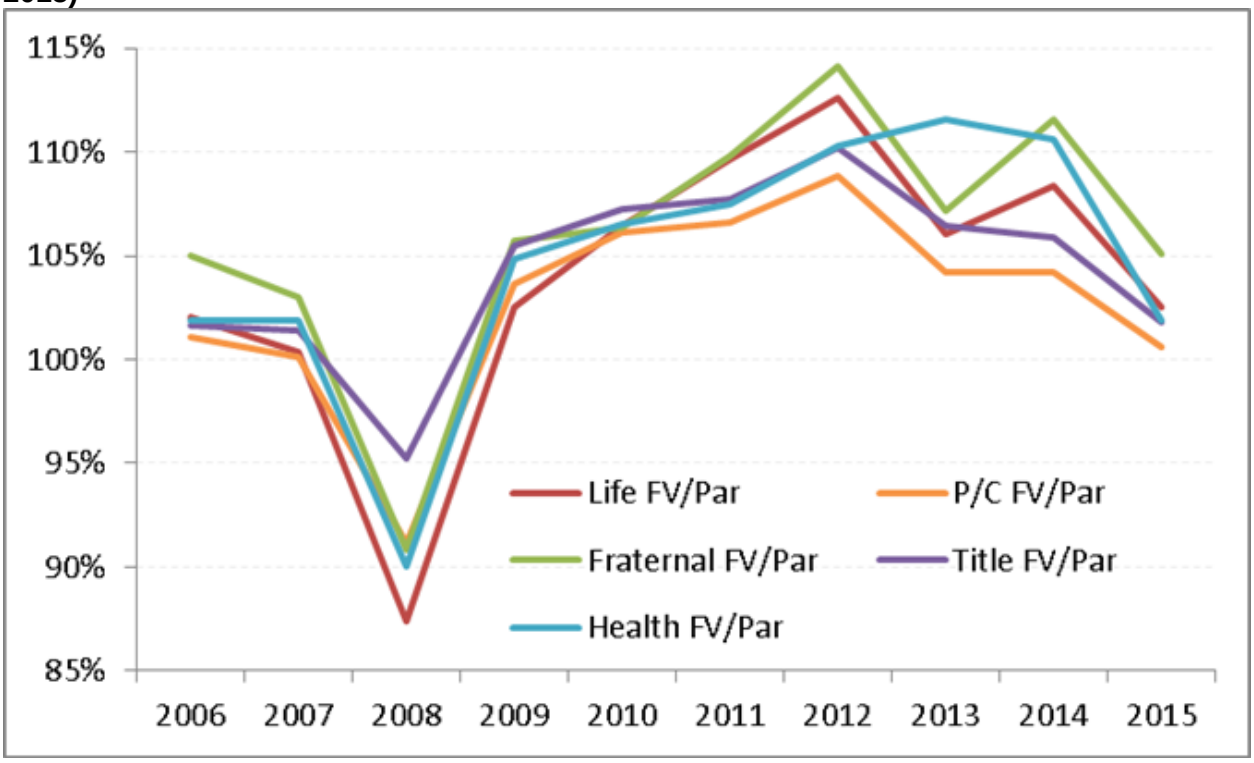
The analysis shows that corporate bonds experienced a steady increase in prices since 2009, when the Fed began a round of interest rate cuts through 2012. Like the aforementioned Dow Jones Corporate Bond Index, the FV of corporate bonds held by insurers has shown a similar pattern of increases since 2009. (See Chart 5.) Given the inverse relationship of price and interest rates, as the Fed increases interest rates, however, FV of these corporate bonds will decrease over time. For the time period analyzed, health companies were the only insurer type to report a FV increase (albeit only 1%) in 2008. The severity of FV decline from year-end 2007 to 2008 differed among the remaining insurer types: life companies, 11% decline; P/C 4%; fraternal 10%; and title 3%.

Chart 5: Fair Value and BACV of Corporate Bonds Held by Insurers (2006-2015)



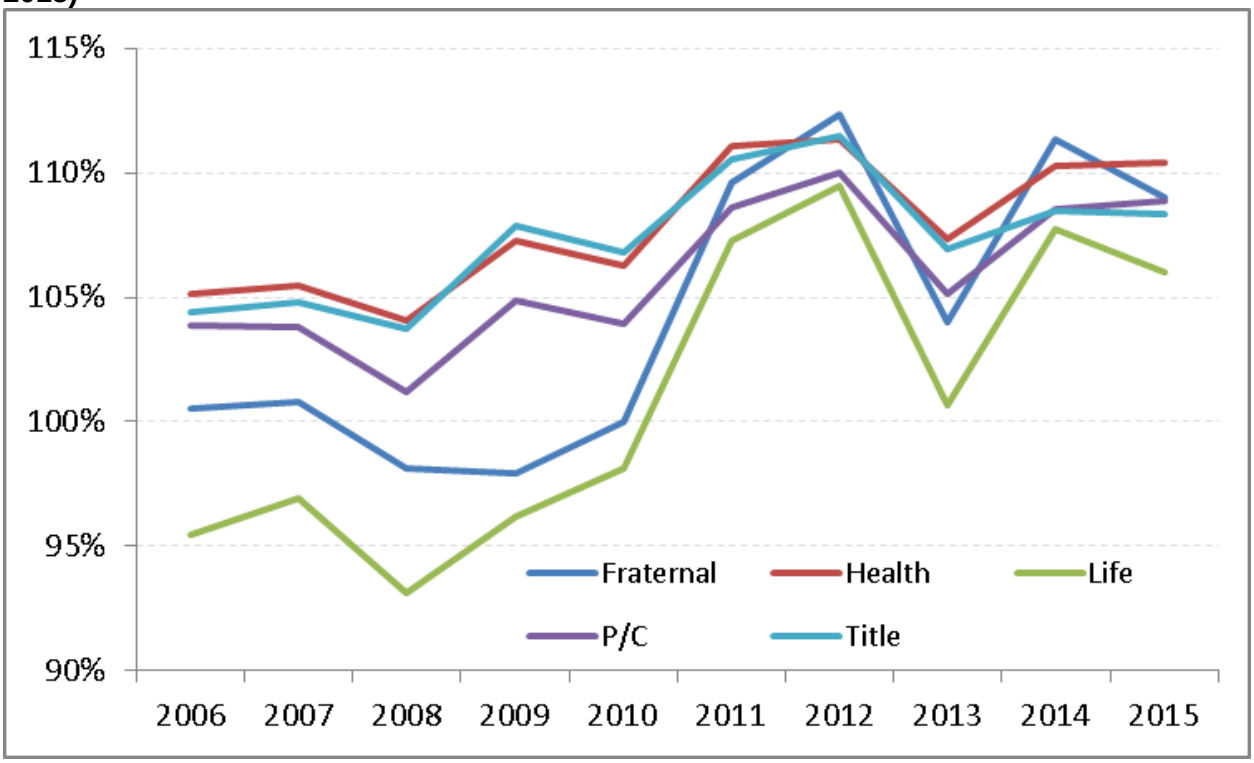
Since 2006, the FV of corporate bonds as a percentage of par held by life and P/C companies has shown predictable directional fluctuations. (See Chart 6.) FV as a percentage of par for corporate bonds held by life companies fell from 102% in 2006 to 87% (significantly affected by the financial crisis, which resulted in impairments and downgrades) in 2008; it peaked at 113% of par in 2012. Note the rate and pattern of growth in the FV of corporate bonds held by life companies is different from the pattern seen with P/C companies. In contrast, the fluctuations of FV as a percentage of par for corporate bonds held by P/C companies was less dramatic. From 101% of par in 2006, FV of corporate bonds held by P/C companies decreased to 91% in 2008 before reaching a peak of 109% in 2012. The difference in the FV trends among insurers' corporate bond exposures may be due to differences in duration and the proportion of non-investment grade and low investment grade corporate bonds held. That is, life and fraternal insurers tend to have longer duration bonds, and greater concentrations of non-investment grade and low investment grade corporate bonds, compared to other insurer types.

Chart 6: Fair Value (as a Percentage of Par) of Corporate Bonds Held by Insurers (2006-2015)



FV as a percentage of par for municipal bonds from 2006 to 2015 was between 99% (as of 2008) and 110% (as of 2012). P/C companies, for which municipal bonds were the largest bond type at 35% of bonds at year-end 2015, reported an average FV of 106% of par from 2006 to 2015. (See Chart 7.) Life companies reported municipal bond holdings with an average FV of 101% of par, and fraternal companies at 104% of par from 2006 to 2015.

Chart 7: Fair Value (as a Percentage of Par) of Municipal Bonds Held by Insurers (2006-2015)



Summary

The decline in interest rates in 2009 resulted in a significant increase in the FV of U.S. insurers' investments continuing to 2011-2012. As cash flows were reinvested at then-current interest rates, the premium of FV over par peaked and has been declining since then. As rates begin to rise—the Fed indicated two possible rate hikes this year—the FV of bonds will likely decline. Within the U.S. insurance industry, the average FV of all bonds at year-end 2015 was still at a premium to par. The two potential rate hikes communicated by the Fed implies a gradual rise in rates. A gradual rise means that the impact of falling asset prices is expected to occur slowly, over a long period of time, giving insurers a chance to adjust their portfolios accordingly. Furthermore, insurers carry the majority of assets at amortized cost (or the lower of amortized cost or FV for low credit quality assets); therefore, a decline in FV is not expected to have a significant impact on insurer balance sheets or impair their reported financial results.

The NAIC Capital Markets Bureau will continue to monitor trends surrounding interest rates and their impact on the FV of the U.S. insurance industry's investment portfolios. We will report on any developments as deemed appropriate.

June 2, 2016 Major Insurer Share Prices			Change %			Prior		
		Close	Week	QTD	YTD	Week	Quarter	Year
Life	Aflac	$69.14	(0.3)	15.4	15.4	$69.35	$59.90	$59.90
	Ameriprise	101.63	0.4	(4.5)	(4.5)	101.26	106.42	106.42
	Genworth	3.58	(2.7)	(4.0)	(4.0)	3.68	3.73	3.73
	Lincoln	45.58	(1.0)	(9.3)	(9.3)	46.04	50.26	50.26
	MetLife	45.47	(0.4)	(5.7)	(5.7)	45.63	48.21	48.21
	Principal	43.60	(1.6)	(3.1)	(3.1)	44.29	44.98	44.98
	Prudential	78.41	(1.2)	(3.7)	(3.7)	79.36	81.41	81.41
	UNUM	36.51	(0.7)	9.7	9.7	36.75	33.29	33.29
PC	Axis Capital	55.04	0.4	(2.1)	(2.1)	54.81	56.22	56.22
	Allstate	67.29	(0.4)	8.4	8.4	67.56	62.09	62.09
	Arch Capital	72.30	0.4	3.7	3.7	72.00	69.75	69.75
	Cincinnati	69.11	0.1	16.8	16.8	69.06	59.17	59.17
	Chubb	127.02	(0.0)	(4.2)	(4.2)	127.03	132.64	132.64
	Everest Re	177.74	(0.3)	(2.9)	(2.9)	178.31	183.09	183.09
	Progressive	33.08	(0.3)	4.0	4.0	33.19	31.80	31.80
	Travelers	114.52	0.4	1.5	1.5	114.06	112.86	112.86
	WR Berkley	56.91	0.6	3.9	3.9	56.58	54.75	54.75
	XL	33.95	(1.3)	(13.3)	(13.3)	34.41	39.18	39.18
Other	AON	$108.69	0.6	17.9	17.9	$108.02	$92.21	$92.21
	AIG	57.53	(1.1)	(7.2)	(7.2)	58.16	61.97	61.97
	Assurant	85.75	(1.6)	6.5	6.5	87.16	80.54	80.54
	Fidelity National	34.62	0.4	(0.1)	(0.1)	34.48	34.67	34.67
	Hartford	44.85	(0.6)	3.2	3.2	45.13	43.46	43.46
	Marsh	65.88	0.2	18.8	18.8	65.78	55.45	55.45
Health	Aetna	$118.41	4.6	9.5	9.5	$113.15	$108.12	$108.12
	Cigna	129.22	0.2	(11.7)	(11.7)	129.02	146.33	146.33
	Humana	181.23	4.7	1.5	1.5	173.04	178.51	178.51
	United	135.75	1.4	15.4	15.4	133.81	117.64	117.64
Monoline	Assured	$27.32	0.8	3.4	3.4	$27.10	$26.43	$26.43
	MBIA	7.22	(2.6)	11.4	11.4	7.41	6.48	6.48
	MGIC	6.91	(1.6)	(21.7)	(21.7)	7.02	8.83	8.83
	Radian	12.05	(3.1)	(10.0)	(10.0)	12.44	13.39	13.39
	XL Capital	33.95	(1.3)	(13.3)	(13.3)	34.41	39.18	39.18

June 2, 2016

Major Market Variables

	Close	Change % Week	Change % QTD	Change % YTD	Prior Week	Prior Quarter	Prior Year
Dow Jones Ind	17,775.49	(0.4)	2.0	2.0	17,851.58	17,425.03	17,425.03
S&P 500	2,095.27	0.1	2.5	2.5	2,094.11	2,043.94	2,043.94
S&P Financial	318.87	(0.2)	(0.9)	(0.9)	319.63	321.73	321.73
S&P Insurance	317.18	(0.3)	3.1	3.1	318.25	307.71	307.71
US Dollar $		Change %			Prior		
/ Euro	$1.12	0.3	2.6	2.6	$1.11	$1.09	$1.09
/ Crude Oil bbl	49.12	(0.2)	32.4	32.4	49.20	37.09	37.09
/ Gold oz	1,211.50	0.2	14.3	14.3	1,208.70	1,059.60	1,059.60
Treasury Ylds %	%	Change bp			%	%	%
1 Year	0.67	(0.02)	0.07	0.07	0.69	0.60	0.60
10 Year	1.81	(0.05)	(0.47)	(0.47)	1.85	2.27	2.27
30 Year	2.58	(0.07)	(0.44)	(0.44)	2.65	3.02	3.02
Corp Credit Spreads -bp		Change %			Prior		
CDX.IG	77.50	1.7	(12.2)	(12.2)	76.24	88.24	88.24

June 2, 2016

Major Insurer Bond Yields

	Company	Coupon	Maturity	Weekly Change Price Current	Price Change	Price Yield	Spread over UST B.P.	Spread over UST Change	YTD Spread Change
Life	Ameriprise	5.300%	3/15/2020	$111.01	($0.94)	2.24%	103	11	8
	Genworth	6.515%	5/15/2018	$98.81	($0.69)	7.17%	619	(9)	8
	Lincoln National	8.750%	7/15/2019	$118.48	$0.11	2.46%	137	40	19
	MassMutual	8.875%	6/15/2039	$148.41	$0.03	5.23%	290	6	35
	MetLife	4.750%	2/15/2021	$111.18	($0.65)	2.22%	85	(4)	(4)
	New York Life	6.750%	11/15/2039	$132.87	($0.07)	4.47%	213	(1)	20
	Northwestern Mutual	6.063%	3/15/2040	$124.04	($0.08)	4.42%	207	4	26
	Pacific Life	9.250%	6/15/2039	$146.93	$2.65	5.60%	328	(1)	40
	Principal	6.050%	10/15/2036	$120.50	$0.51	4.50%	227	(6)	18
	Prudential	4.500%	11/15/2020	$109.24	$0.05	2.30%	101	5	(8)
	TIAA	6.850%	12/15/2039	$131.12	$1.08	4.66%	232	0	5
P&C	ACE INA	5.900%	6/15/2019	$111.96	($0.13)	1.81%	75	(8)	(8)
	Allstate	7.450%	5/15/2019	$115.30	($0.28)	2.06%	88	(23)	(10)
	American Financial	9.875%	6/15/2019	$120.28	($0.24)	2.82%	160	(4)	(18)
	Berkshire Hathaway	5.400%	5/15/2018	$108.15	($0.18)	1.14%	21	(9)	(21)
	Travelers	3.900%	11/15/2020	$108.61	$0.41	1.85%	58	2	(14)
	XL Group	6.250%	5/15/2027	$116.90	($0.61)	4.30%	231	(4)	35
Other	AON	5.000%	9/15/2020	$110.65	($0.22)	2.39%	111	(3)	7
	AIG	5.850%	1/15/2018	$106.66	$0.36	1.64%	81	5	(5)
	Hartford	5.500%	3/15/2020	$111.65	($0.22)	2.29%	109	2	(8)
	Nationwide	9.375%	8/15/2039	$149.01	($0.28)	5.58%	326	(4)	44
Health	Aetna	3.950%	9/15/2020	$106.63	($1.12)	2.30%	102	42	7
	CIGNA	5.125%	6/15/2020	$110.57	($0.49)	2.36%	105	(18)	(15)
	United Healthcare	3.875%	10/15/2020	$108.02	($0.14)	1.95%	56	(16)	(14)
	Wellpoint	4.350%	8/15/2020	$107.80	($0.39)	2.38%	108	(16)	(13)

Questions and comments are always welcome. Please contact the Capital Markets Bureau at **CapitalMarkets@naic.org**.