## FEDERAL RESERVE BANK OF MINNEAPOLIS

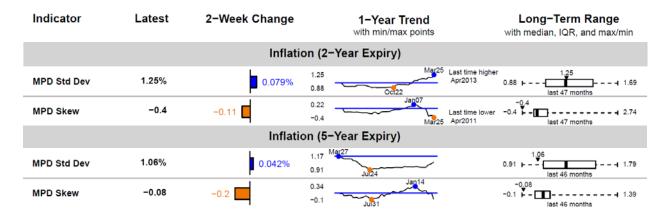
BANKING AND POLICY STUDIES

## **Minneapolis Options Report – March 27<sup>th</sup>**

Uncertainty in inflation expectations is increasing, as measured by MPD standard deviations derived from caps and floors on the CPI. After the March FOMC meeting both long and short interest rates have declined, and MPD skews suggest a general shift in market sentiment toward lower rates. The dollar has weakened against the euro and yen, and market-implied uncertainty has decreased, as seen in falling MPD standard deviations. One outcome from the disclosure of the 2015 CCAR results appears to be a reduction in investor uncertainty surrounding the value of CCAR banks, which we observe through declining MPD standard deviations. MPD skew on the iShares U.S. Real Estate Index has become less negative, possibly implying less investor bias toward future price declines in the real estate sector.

#### Inflation

Over the last two months, changes in market-based inflation expectations derived from caps and floors on the CPI for 2- and 5-year periods have implied both increases in uncertainty as well as bias toward future lower rates (see figure below). We use MPD standard deviation as a proxy for uncertainty, and MPD skew as a proxy for bias in expected future rates.

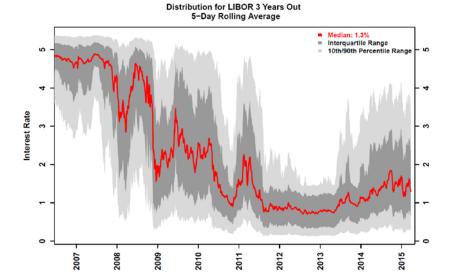


#### Additional detail:

- Median expectations for inflation from market-based probability distributions (MPDs) have increased over the past two weeks but have stayed range-bound for the past 4-6 weeks. They now sit at 1.35%, 1.58%, and 1.81% for the 1-, 2-, and 5-year tenors, respectively.
- Despite the increases in MPD standard deviations over the last two months, uncertainty regarding market-based CPI inflation expectations, as measured by both MPD standard deviation and interquartile range, remains near multi-year lows in the 5-year tenor.

#### Interest Rates

During this two-week report cycle which included the March FOMC meeting, prices on 5- and 10-year treasuries have increased by 1% and 1.4%, respectively, and yields have dropped. MPD standard deviations have fallen, suggesting decreases in investor uncertainty around rates at the longer end of the curve. Median short-term interest rate expectations, as derived from caps and floors on three month LIBOR, have also decreased considerably. The 3-year tenor has fallen -28 bps to 1.31% (see figure below), and the 5-year tenor has fallen -41 bps to 1.46%. The MPD standard deviation of the 3-year tenor has dropped modestly, suggesting shifts in market expectations toward lower short interest rates and more certainty in the near-term.



#### Additional detail:

• MPD skews for 5- and 10-year treasury prices have remained positive and relatively flat over the last month, suggesting continued investor bias toward low yields at the longer end of the curve (treasury prices move inversely to yields).

#### Banks and Insurance Companies

Over the past two weeks, the S&P 500 gained 1%, and price changes in the bank (17) and insurance (11) company stocks we follow were mixed. Two European banks, CS and DB, had substantial positive returns over this period, 6.5% and 10.2%, respectively. Insurance company equity returns averaged 1%, tracking the S&P 500.

CCAR results were released on the 11th of March after market close. The results appear to have reduced levels of investor uncertainty, as measured by MPD standard deviations, with the biggest two-week drop in a CCAR bank occurring at BAC (-2%). The average standard deviation derived from options on CCAR bank equities decreased by -0.7%.

#### Additional details:

 MPD skew on PFG fell considerably over the past two weeks from positive to negative (see figure below). Volume of options on the firm increased dramatically. This coincides with the release of February 2015 financials and a downgrade from equity analysts at Goldman Sachs.



#### Other Markets

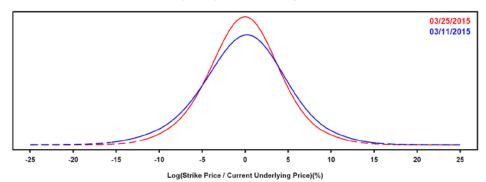
- The MPD skews derived from 6- and 12-month-out options on the S&P 500 index have become less negative, suggesting that market-implied tail risk has declined somewhat.
- The iShares U.S. Real Estate Index gained 3.1% over the last two weeks and its skew became substantially less negative, implying potentially less investor bias toward future price declines in the real estate sector. We should note that despite being negative the skew is near the upper-end of its 4-year range.

• The dollar weakened against the euro and yen, and remained flat against the pound. This was particularly evident in the Euro-USD exchange rate, which rose by 4.8%. MPD standard deviations declined over the last two weeks for the Euro-USD and Yen-USD pairs (see chart below), signaling a decrease in investor uncertainty.

#### MARKET PROBABILITY DENSITY FUNCTIONS -- DOLLAR-YEN EXCHANGE RATE FUTURES

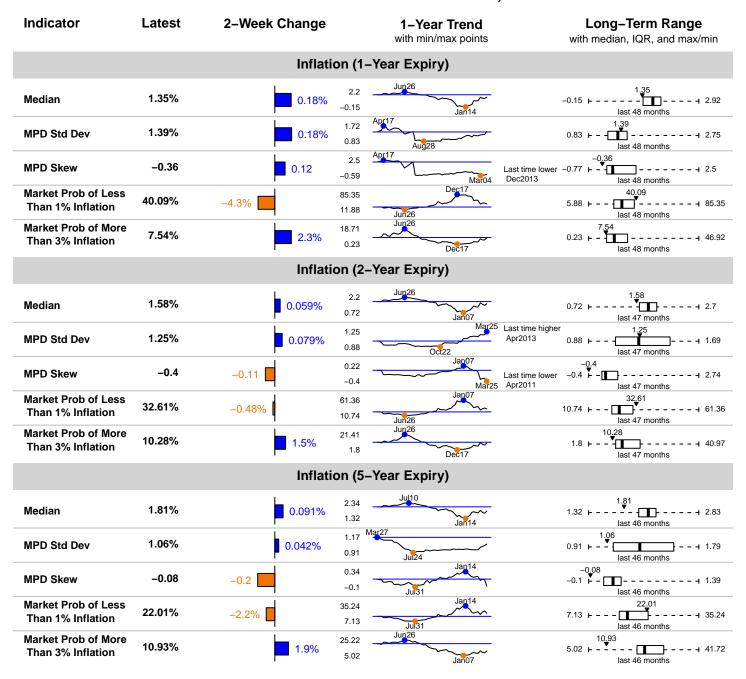
Log returns are based on the market probability density function of the underlying asset derived from options that expire in approximately 3 months.

Market Probability Density Function of the Log Return Distribution



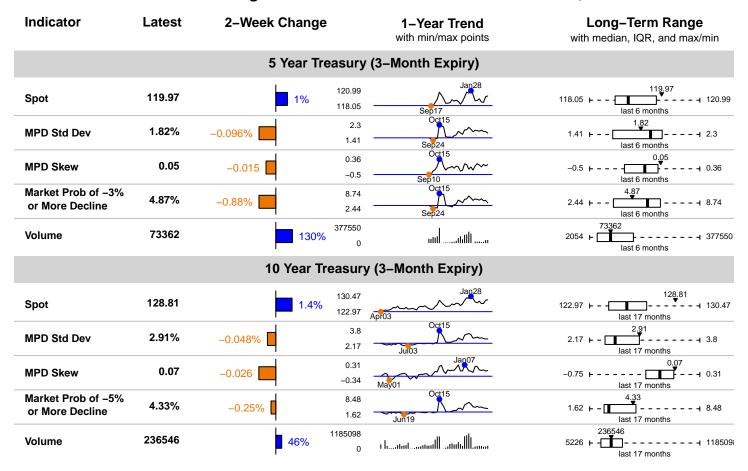
- Spot prices for gold and silver increased by 4% and 11%, respectively. Decreases in their MPD standard deviations suggest reduced investor uncertainty.
- The spot price of WTI crude oil fell by 2%, and the MPD skew declined and remains highly negative. This indicates a continued bias towards lower future prices of WTI crude.
- Agricultural commodity spot prices were mixed, though wheat and live cattle returned 3.4% and 4.4%, respectively. Wheat skew dropped considerably but remains positive and well over its 4year median. Corn skew is even higher relative to its 4-year median. This is suggestive of marketimplied bias towards higher future prices.

#### Inflation MPD Statistics as of March 25, 2015

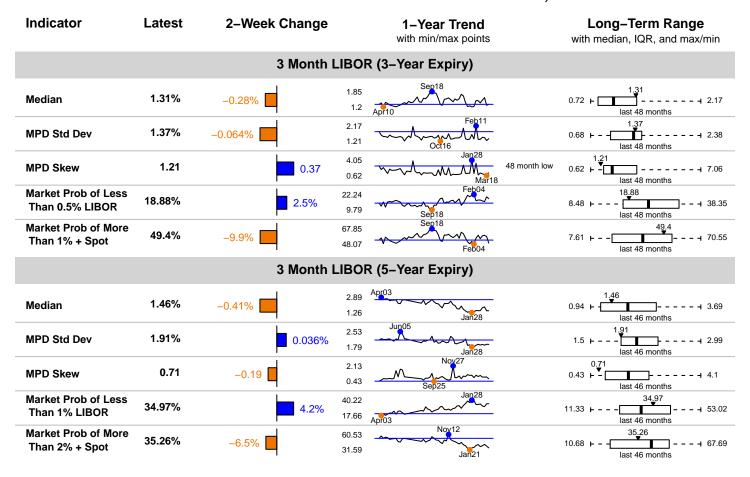


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## Medium-to-Long Bond Price MPD Statistics as of March 25, 2015

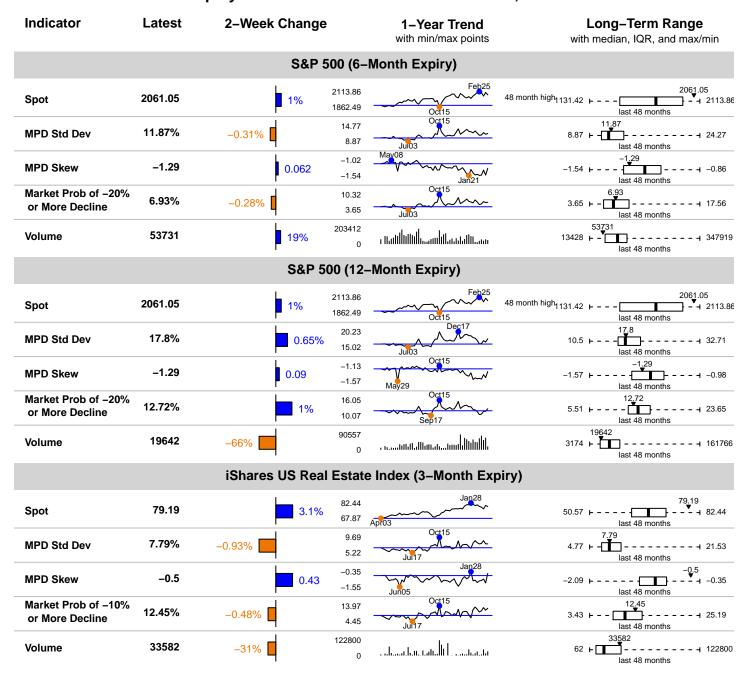


## Short Interest Rates MPD Statistics as of March 25, 2015



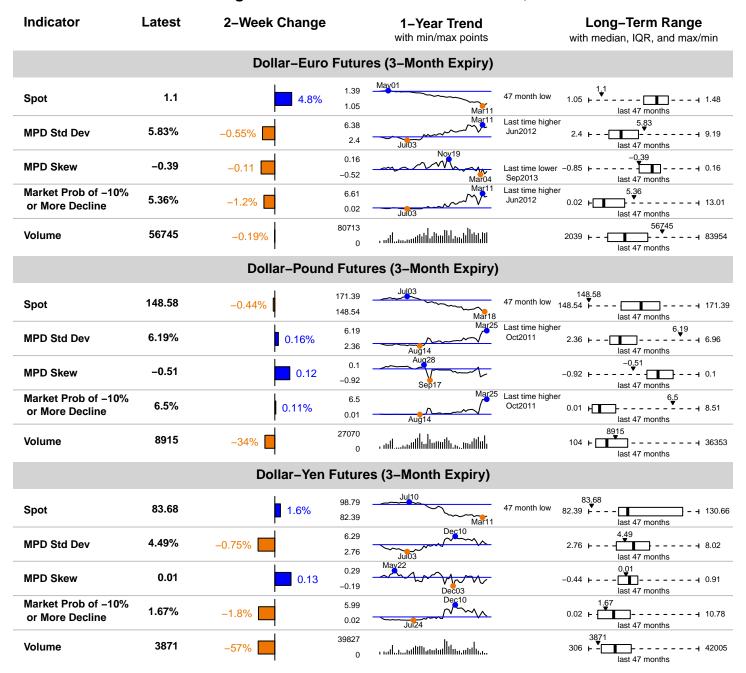
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## Equity Index MPD Statistics as of March 25, 2015

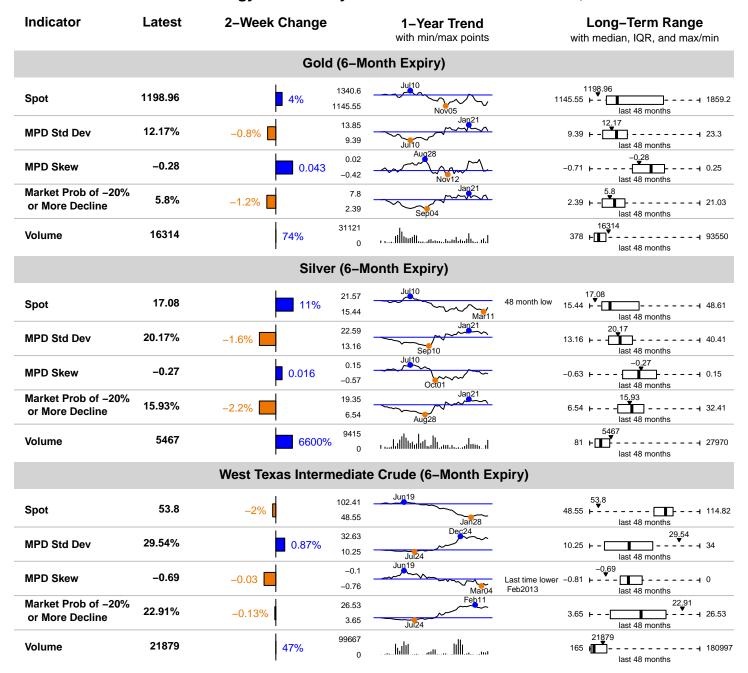


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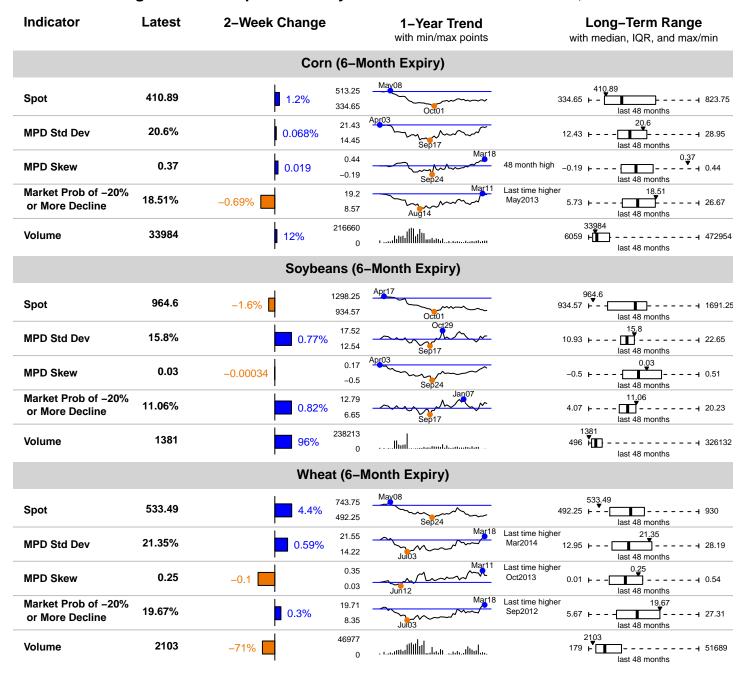
## Exchange Rate MPD Statistics as of March 25, 2015



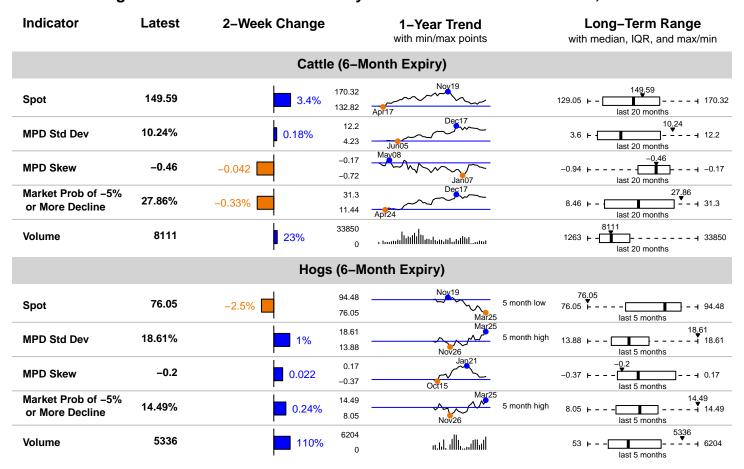
## Metal and Energy Commodity MPD Statistics as of March 25, 2015

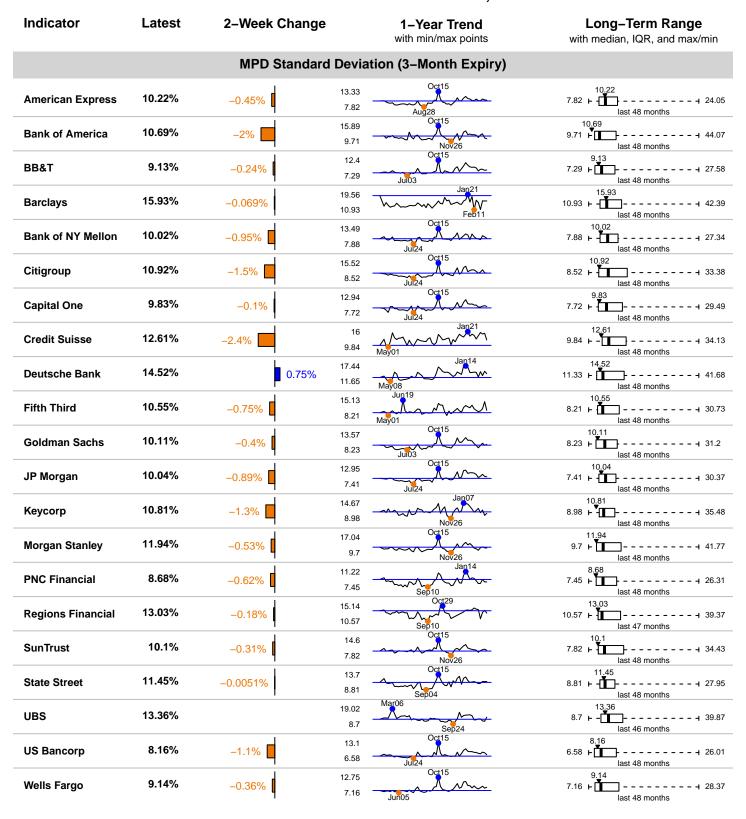


## Agricultural Crop Commodity MPD Statistics as of March 25, 2015

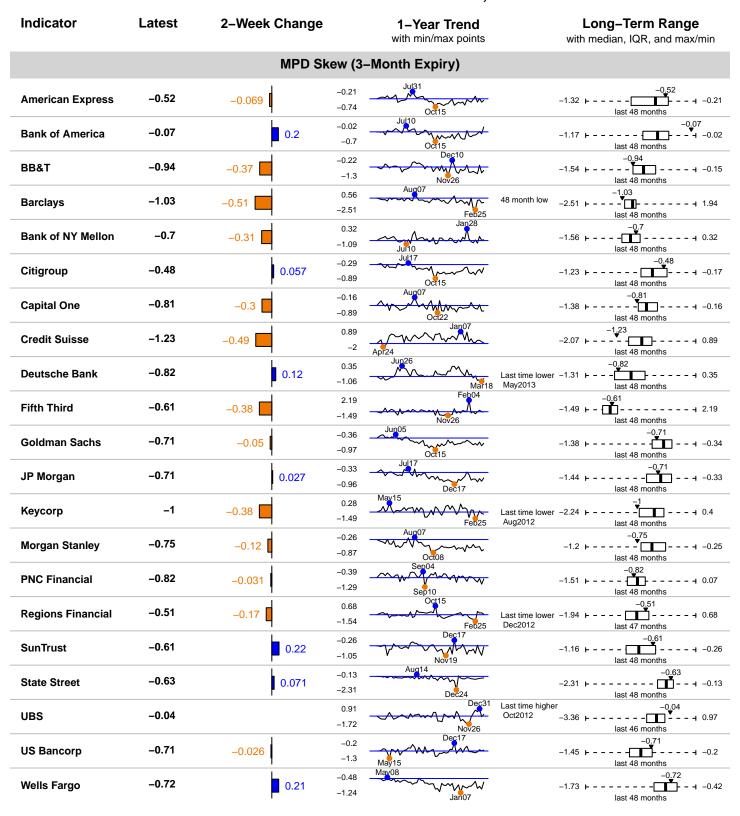


# Agricultural Livestock Commodity MPD Statistics as of March 25, 2015

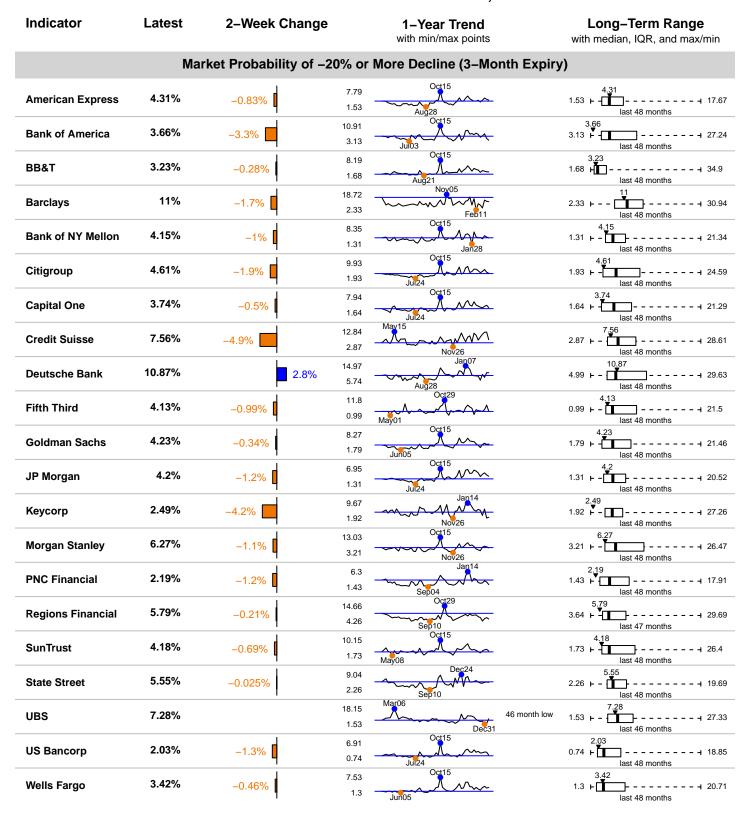




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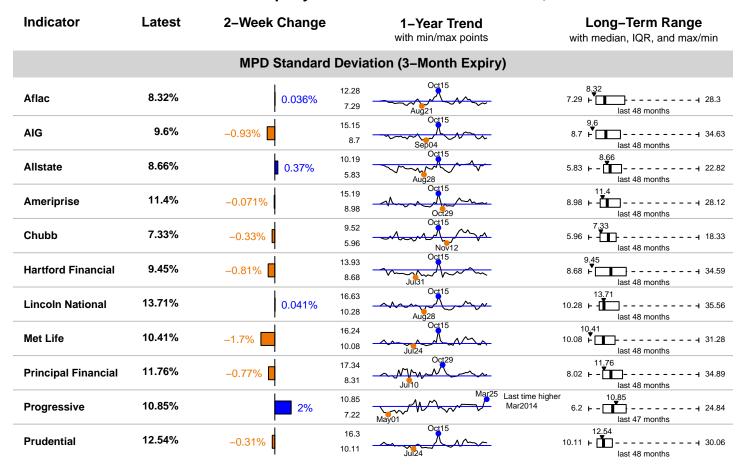
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Indicator	Latest	2-Week Change	•	1-Year Trend with min/max points	Long-Term Range with median, IQR, and max/min				
Volume (3-Month Expiry)									
American Express	6047	-24%	28004 0	. 16.1016	623 F 1 28004 last 48 months				
Bank of America	108235	24%	133777 0	. danalaaddalaaaddululul	108235 7419 ►				
BB&T	2492	20%	6490 0	. Haasanadd aasanasaladuusu	2492 190 + - 6903 last 48 months				
Barclays	433	-72%	11011 0	rallamenta landu. anananta	433 13 <b>11</b> 15208 last 48 months				
Bank of NY Mellon	2663	-58%	15678 0		2663 59 HIII 1 17091 last 48 months				
Citigroup	38183	120%	140439 0		38183 1104 <b>⊢                                   </b>				
Capital One	1275	100%	5543 0	r Hazarahazaan kirahat Harar	1275 164 + 16299 last 48 months				
Credit Suisse	2951	1100%	15145 0		2951 0 <b>+</b>				
Deutsche Bank	1867	56%	25112 0		1867 76 <b>- 1</b> 1867 181 48 months				
Fifth Third	727	-61%	6299 0	. Hadanandantd caandaa	727 28 <b>- 1</b> 19127 last 48 months				
Goldman Sachs	7015	160%	15721 0	. Mutthuatustushidasa.asaasat	7015 296 <b>⊢ - 1 </b>				
JP Morgan	11185	-30%	79587 0	r hannaatidaaaaattaaad	11185 943 <b>- 11924</b> last 48 months				
Keycorp	1996	210%	3300 0	t lina mentice and be added based	1996 44 <b>(</b>				
Morgan Stanley	2950	-58%	48955 0	. har, t	2950 327 → □ 84281 last 48 months				
PNC Financial	1075	-2.5%	4810 0	r hantanal taransunaenlatihatitan	1075 83 <b> 1</b> 12224 last 48 months				
Regions Financial	47940	54009	47940 % 0		47940 20 н∏ 47940 last 47 months				
SunTrust	1018	-79%	4808 0		1018 61 <b>μ∭</b> – – – – – – → 13788 last 48 months				
State Street	1357	140%	5339 0	. latumbanananatat.aluanat	1357 42 <b>⊢</b>				
UBS	124		2034 0	r I I I - tumashitutaanan aasaa	6 HL + 6502 last 46 months				
US Bancorp	4763	270%	9006 0		4763 172 H 1 29201 last 48 months				
Wells Fargo	6590	56%	62697 0	. nadra.aaraaddilliha.a.tiimna.	6590 950 HIII 1 167820 last 48 months				

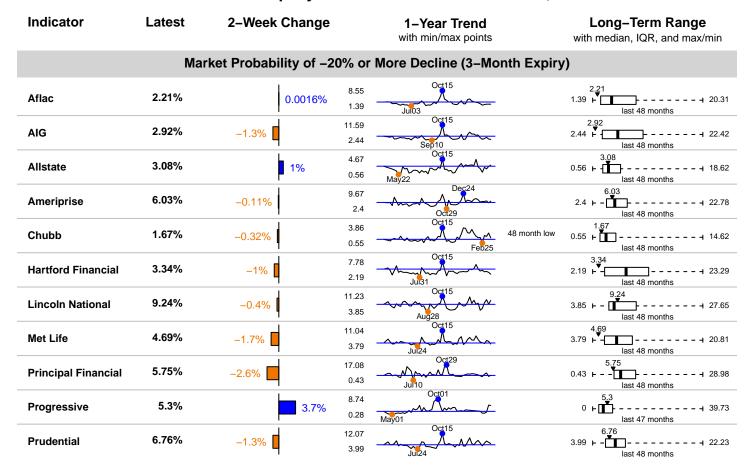
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Indicator	Latest	2-Week Change	1–Year Trend with min/max points	Long-Term Range with median, IQR, and max/min					
MPD Skew (3-Month Expiry)									
Aflac	-0.67	0.059	.08 Jun19 Oct29	-1.24 +					
AIG	-0.51	0.034	0.23 Dec31 0.84 Feb18	-0.51 -1.23 <b>⊦ ∐</b> 1 0.52 last 48 months					
Allstate	-0.95	-0.43	Jul31 -1.5 Nov12	-0.95 -1.5 <b>⊢ </b>					
Ameriprise	-0.67	-0.0059	.11 Dec31 .44 Oct15	-0.67 -4.03 <b>⊦ </b>					
Chubb	-0.9	_0 14	.15 Aug14 Dec24	-1.56 <b></b> -0.9 -1.56 <b></b> 0.21 last 48 months					
Hartford Financial	-1.02	-0.038	.59 Jul 17 Oct 29	-1.02 -1.59 <b>+ </b>					
Lincoln National	-0.93	_0 049	0.15 May01 .02 Nov19	-0.93 -1.59 <b>⊢ </b>					
Met Life	-0.46	0.14	0.35 Jul31 0.82 Dec10	-0.46 -1.52 <b>⊢ </b>					
Principal Financial	-1.82	_1 2	0.21 Oct15 2.87 Aug21	-1.82 -2.95 + 0.22 last 48 months					
Progressive	-1.27	_1 6	0.42 Mar04 2.75 Nov12	Last time higher -1,27  Jul2011 -3.54 + 10.71  last 47 months					
Prudential	-0.37	0.22	0.36 May01 0.82 Nov05	-0.37 -1.45 +					

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Indicator	Latest	2-Week Change		1-Year Trend with min/max points	Long-Term Range with median, IQR, and max/min				
Volume (3-Month Expiry)									
Aflac	3102	0.42%	13324 0		3102 405 <b>-</b> 4 22718 last 48 months				
AIG	10683	280%	69392 0	thutaa.thualaa.aa.ah.a	10683 432 H				
Allstate	338	440%	2913 0	. ualumaalataantalalaaanataa	338 63 <b>1</b> 68926 last 48 months				
Ameriprise	176	8.6%	1071 0	r da and nta antiba alatanan	5 + 176 5 last 48 months				
Chubb	89	22%	9027		89 11 <b>1</b> 11114 last 48 months				
Hartford Financial	508	-56%	9199 0		508 65 HL 37285 last 48 months				
Lincoln National	141	<b>-72</b> %	8403 0		141 51 HT 1 10682 last 48 months				
Met Life	3663	-67%	29248 0		3663 319 <b>1</b> − − − − − − − 161416 last 48 months				
Principal Financial	130	86%	545 0	بمأسلما تساسا ما مستمانات	130 2 ∰ 3846 last 48 months				
Progressive	773	8500	773 0		773 0 ¶ 4283 last 47 months				
Prudential	4780	130%	13225 0	. da.inlalada mahraraanidini	4780 222 <b>⊢                                 </b>				

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