FEDERAL RESERVE BANK OF MINNEAPOLIS

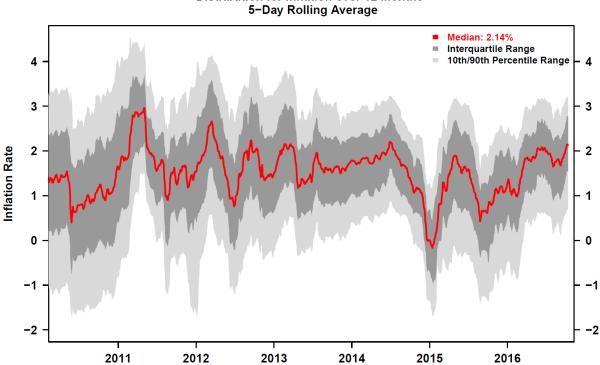
BANKING AND POLICY STUDIES

Minneapolis Options Report - October 14th

Over the past two weeks, market-implied inflation expectations rose across all tenors we follow (1- and 5-year periods), while changes in market-based probability distribution (MPD) standard deviations and skews were flat. The S&P 500 returned -1.5% and average changes in MPD standard deviation were slight, increasing by 0.3 percentage points. The banking and insurance firms we follow outperformed the market respectively returning 1.6% and 1.9% on average. The dollar was stronger against all currencies we follow; the USD-Pound pairing suffered its second largest decrease in four years on news of the UK's pending exit from the EU, dubbed the "Brexit." BCS registered its second largest MPD standard deviation increase in the past year due to "Brexit" concerns.

Inflation

Market-based inflation expectations derived from caps and floors on the CPI for 1- and 5-year periods rose over the 2-week period to 2.18% and 1.85% respectively. This increase is best observed in the 1-year tenor (see figure, below).



Distribution for Inflation over 12 Months

Additional detail:

- The probability of low inflation, defined as the market probability of less than 1% inflation, sits at its lowest point in one year for both tenors; the measure for the 1- and 5-year tenors declined by 3.1 and -2.9 percentages points respectively.
- Changes in MPD statistics have been flat for the 1- and 5-year tenors since April, 2016.

Interest Rate

Spot prices for all Treasury tenors fell over the two week period, and consequently yields rose. Changes in MPD statistics were flat over the two week period for both the 5- and 10-year tenors; MPD skew levels currently indicate neutral bias for both tenors. 3- and 5-year LIBOR tenors rose by 5.5 and 5.4 basis points respectively. Although MPD skews for both LIBOR tenors were down over the two week period, both signal bias towards higher future LIBOR rates.

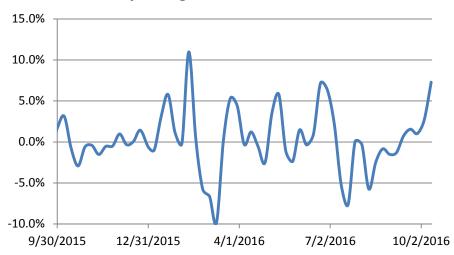
Banks and Insurance Companies

The S&P 500 fell by -1.5% over the past two weeks with the 6- and 12-month tenors posting an average MPD standard deviation increase of 0.3 percentage points. The 19 banking firms we follow posted a 1.6% return, outperforming the market. The 11 insurance companies we follow outperformed the market as well, returning 1.9% on average.

Additional details:

While most banks experienced a slight increase in MPD standard deviation BCS registered a 7.3 percentage point increase due to the drop in the pound relative to the dollar and how the pound's decline will affect the potential fines the US Justice Department is seeking over crisis era mortgage back securities. The increase implies that investor uncertainty has risen surrounding the bank. It is the second largest increase in the past year (see chart below).

Biweekly change in MPD Standard Deviation

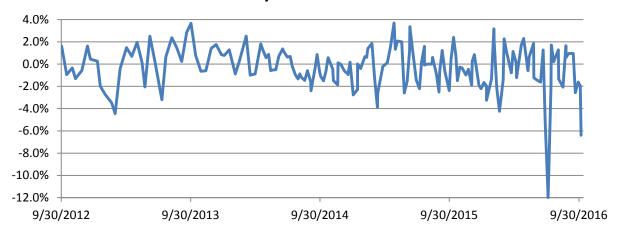


• MPD standard deviation for most insurers moved in line with the S&P 500; PGR, the lone outlier, rose by 4.7 percentage points over the two week period.

Other Markets

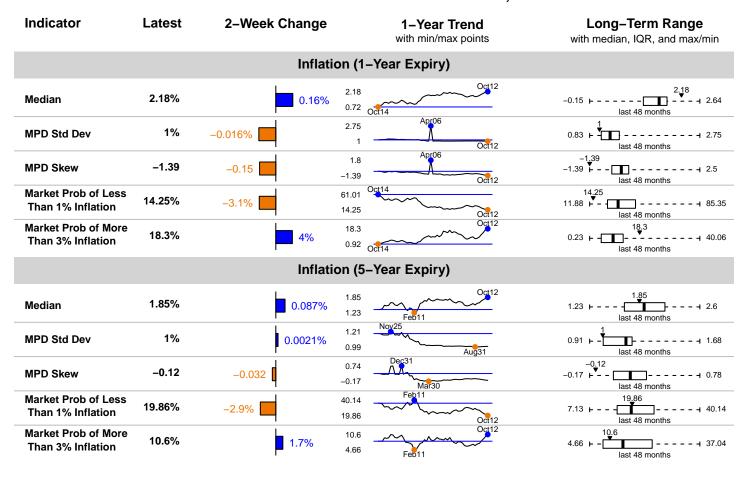
- The iShares US Real Estate Index underperformed the markets, posting a -5.7% return. MPD standard deviation increased by 1 percentage point.
- The dollar was stronger against all currencies we follow. MPD Standard deviation for the pound was higher by 1.3 percentage points. Notably the USD-Pound pair spot dropped -6.4% on news that the "Brexit", will occur in the near future. The fall represents the second largest drop in the past four years (see chart below).

Biweekly USD-Pound Returns



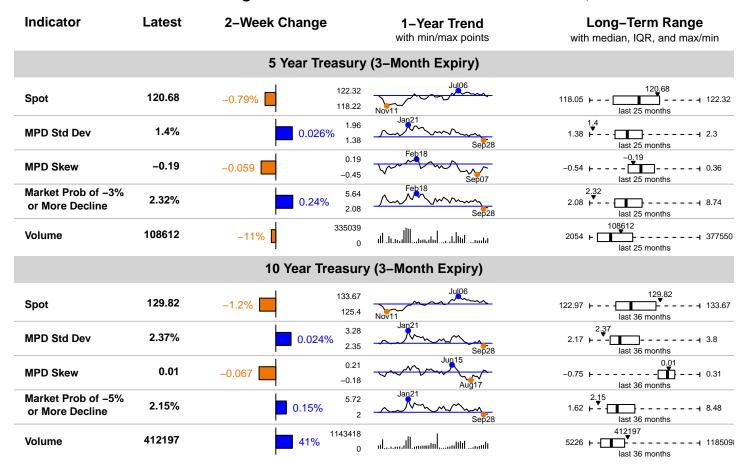
- Gold and silver posted declines of -5% and -8.4% over the two week period. MPD skews fell for both metals and currently signal neutral bias.
- WTI crude gained 6.6% while its MPD standard deviation fell by -3.2 percentage points. MPD skew set a new one year low.
- Returns for agricultural crops (soybeans, corn, and wheat) were mixed with corn gaining 2.4%, wheat losing 2.2% and soybeans gaining slightly with 0.2%. MPD standard deviation for soybeans fell by -0.6 percentage points.
- Cattle returned -4.7%, setting a new 4-year low. Hogs jumped by 13%, as MPD standard deviation fell -3.5 percentage points.

Inflation MPD Statistics as of October 12, 2016

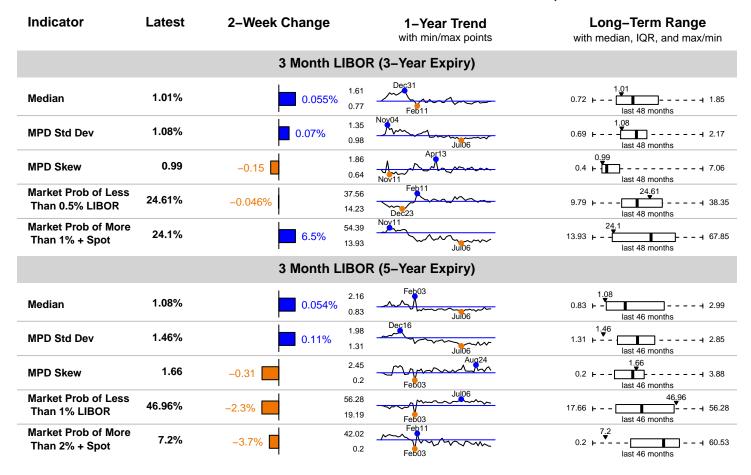


Source: Bloomberg Page 1 of 16

Medium-to-Long Bond Price MPD Statistics as of October 12, 2016

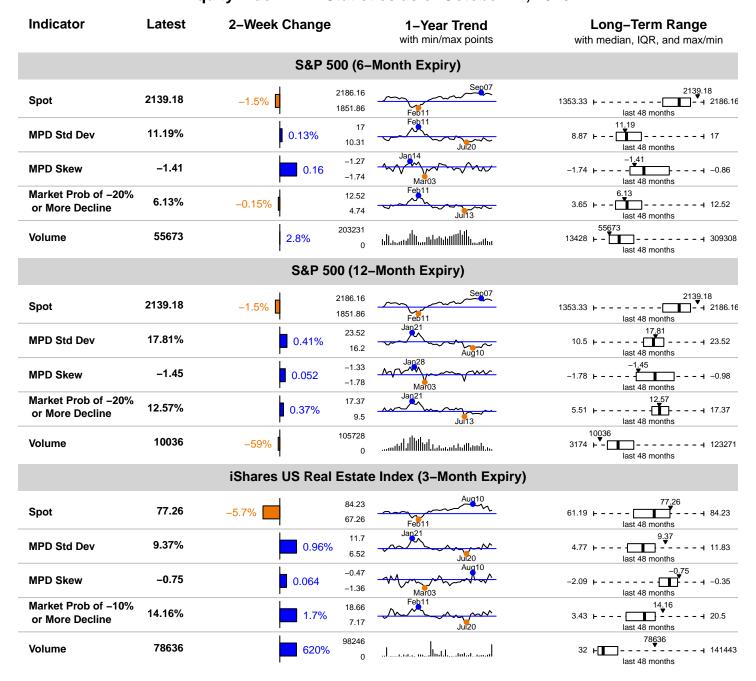


Short Interest Rates MPD Statistics as of October 12, 2016



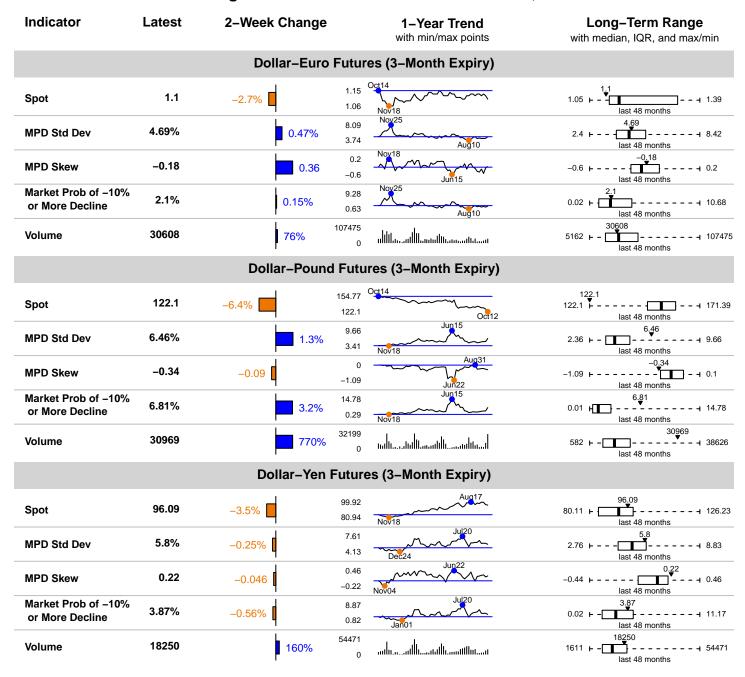
Source: Bloomberg Page 3 of 16

Equity Index MPD Statistics as of October 12, 2016

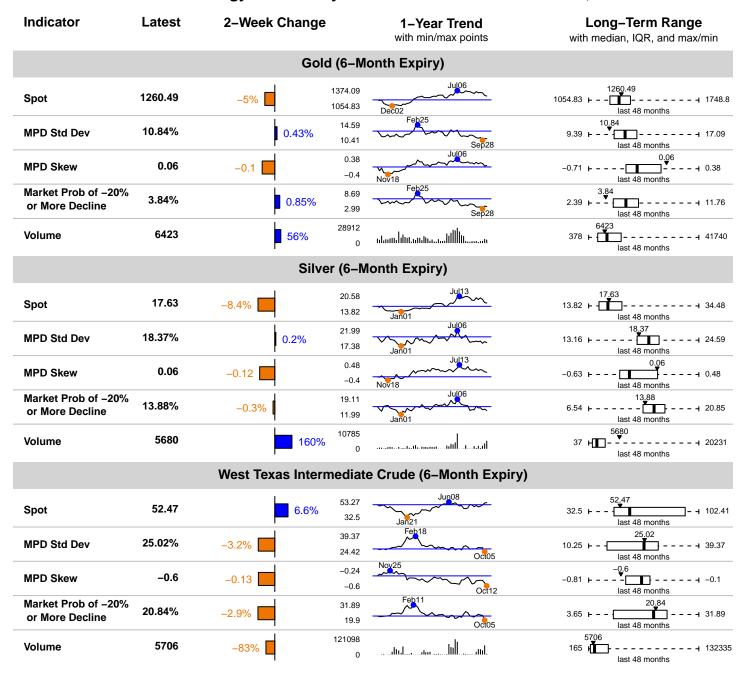


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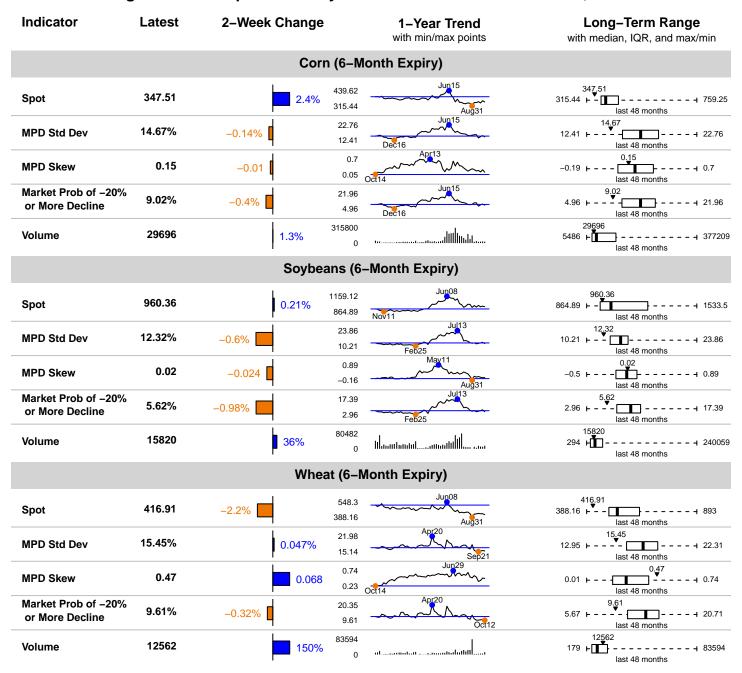
Exchange Rate MPD Statistics as of October 12, 2016



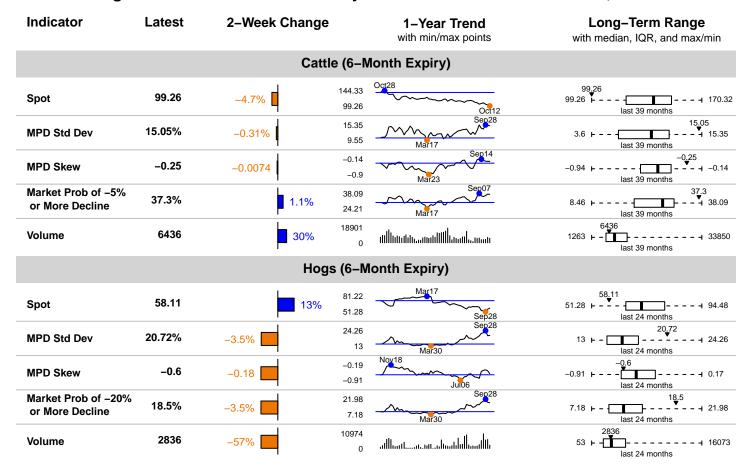
Metal and Energy Commodity MPD Statistics as of October 12, 2016

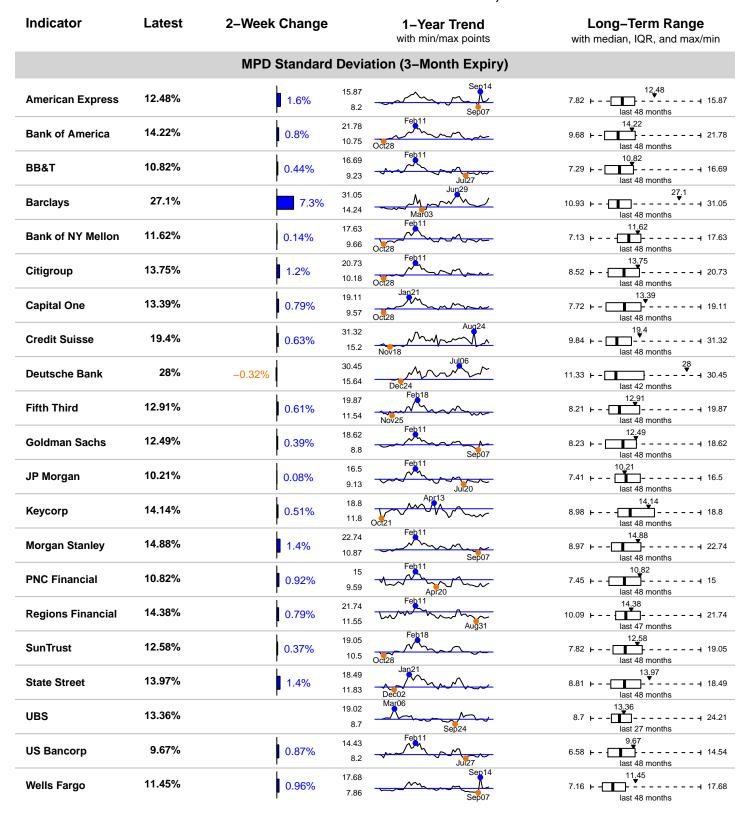


Agricultural Crop Commodity MPD Statistics as of October 12, 2016



Agricultural Livestock Commodity MPD Statistics as of October 12, 2016

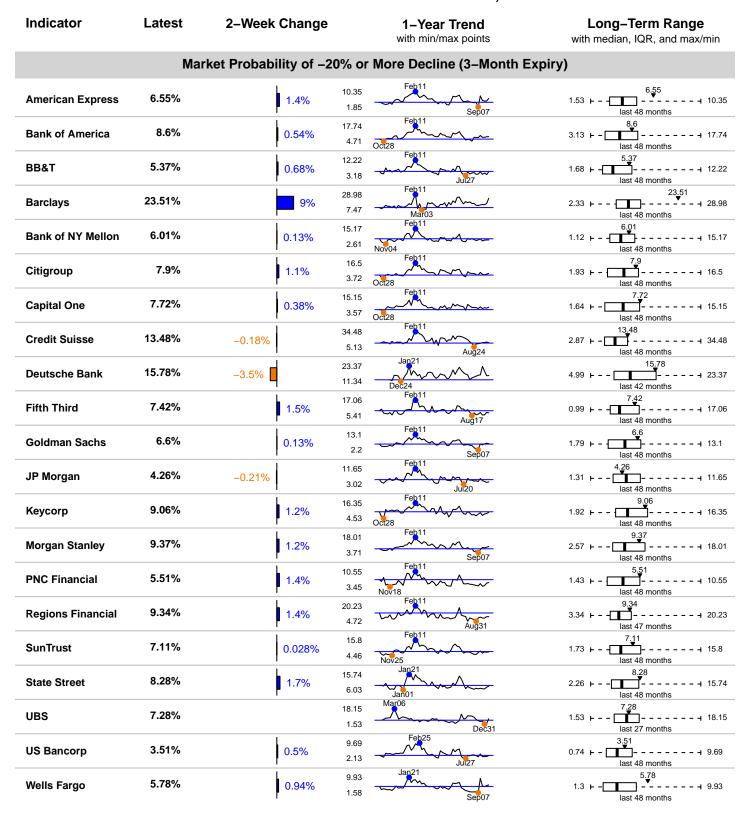




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Indicator	Latest	2-Week Change	1–Year Trend with min/max points	Long-Term Range with median, IQR, and max/min		
MPD Skew (3-Month Expiry)						
American Express	-0.63	0.3	-0.21 Sep14 -0.99 Sep21	-0.99 F		
Bank of America	-0.52	0.12	-0.05 Jan ⁰¹ -0.83 Fe ⁰ 18	-0.99 F		
BB&T	-0.94	0.43	-0.5 Nov25 -1.76 Sep14	-1.76 -0.94 -1.760.15 last 48 months		
Barclays	-0.24	0.26	0.6 Dec09 -1.88 May25	-0.24 -2.51 + III 1.94 last 48 months		
Bank of NY Mellon	-0.53	0.47	-0.01 Nov04 -1.39 Nov11	-0.53 -1.39 + 1 0.32 last 48 months		
Citigroup	-0.71	0.13	-0.52 -1.04 Feb25	-0.71 -1.17 +		
Capital One	-0.76	0.12	-0.23 Oct14 -1.2 Mar03	-0.76 -1.2 i 1 -0.16 last 48 months		
Credit Suisse	-0.78	-0.034	0.87 Nov18 -2.76 Aug24	-0.78 -2.76 ⊢ □□□ - 1.81 last 48 months		
Deutsche Bank	-1.52	-0.46	0.41 Dec02 -1.52 Oct12	-1.52 -1.52		
Fifth Third	-0.71	0.034	0.25 Jan ²⁸ -1.69 Dec ²⁴	-0.71 -1.69 ⊢ ∭ 1 2.19 last 48 months		
Goldman Sachs	-0.81	N 19	-0.15 Sep14 -0.99 Sep28	-0.81 -1.09 ⊦ ▼		
JP Morgan	-0.91	0.25	-0.55 Oct21 -1.22 Sep21	-0.91 -1.22 +		
Keycorp	-0.8	-0.22	0.34 Jan ²⁸ -1.79 May ¹⁸	-0.8 -1.79 ⊢ 		
Morgan Stanley	-0.7	0.14	-0.33 Sep14 -1.04 Mar03	-0.7 -1.12 +		
PNC Financial	-1.07	-0.1	-0.42 Jan28 -1.84 Oct28	-1.07 -1.84 +		
Regions Financial	-0.69	0.32	-0.03 Mar10 -1.6 Aug03	-0.69 -1.94 ⊢ 1 0.68 last 47 months		
SunTrust	-0.87	I 0 093	-0.21 Feb11 -1.27 Jan01	-1.27 +		
State Street	-0.95	0.13	-0.19 Jan14 -1.42 Aug31	_0.95 _2.31		
UBS	-0.04		0.91 -1.72 Dec31 Nov26	-3.36 ⊢ 		
US Bancorp	-0.74	0.22	-0.51 Oct14 -1.55 Nov04	-1.55 +		
Wells Fargo	-0.63	0.24	-0.06 Sep14 -1.1 Mar03	-0.63 -1.3 +		

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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	2500	81%	22968 0	llucaradorarananananul	2500 532 + 32713 last 48 months	
Bank of America	65270	-33%	187673 0	dathdudtut.a.aautt.titla.du	65270 7419 ⊢ 195347 last 48 months	
BB&T	759	-67%	5986 0	aa.dh.a.a.dahamtatata	759 126 + 6490 last 48 months	
Barclays	587	-45%	18909 0	lutana.	587 8 1 18909 last 48 months	
Bank of NY Mellon	372	-33%	33235 0	<u>ll</u>	372 44 ♣ 33235 last 48 months	
Citigroup	19772	-6.8%	90561 0	aadmiduatiaddiladi	19772 1104 ⊢	
Capital One	756	-36%	9096 0		756 136 H 1 16299 last 48 months	
Credit Suisse	5829	330%	31577 0	.n	5829 0 1 → 31577 last 48 months	
Deutsche Bank	23466	-29%	99132 0		23466 76 9 9132 last 42 months	
Fifth Third	24	-97%	6123 0		24 24 19127 last 48 months	
Goldman Sachs	3029	56%	28155 0	dalu.aatdaranad.dudadll	3029 612 ⊢ I 28155 last 48 months	
JP Morgan	48397	120%	55464 0	ar	48397 943 ⊢Ⅲ → 132116 last 48 months	
Keycorp	444	-35 %	5129 0	at.autit.naltilnaitanatalaaa.	444 44 4 27404 last 48 months	
Morgan Stanley	2656	-34%	36166 0	distancibationarani, considition	2656 327 +	
PNC Financial	588	-67%	4932 0		588 42 ⊢ 1 − − − − − − − − − − − − − − − − − − 	
Regions Financial	305	-69%	4754 0	عامير الباديانية المتناسلينية المتناسلين	305 20 1 47940 last 47 months	
SunTrust	1234	-0.8%	11023 0	adata adalam adath ana ada ad	1234 61 ⊢∐ 13788 last 48 months	
State Street	507	37%	2700 0	والماللة أسال سين المسادة والمسادة	507 19 - H LL 5339 last 48 months	
UBS	124		2034 0	r I I I I amaa dhulaa aana aa aa	124 23 11 6502 last 27 months	
US Bancorp	1573	82%	9418 0	متميد والألايما الماسيما المتعددة	1573 52 H → 29142 last 48 months	
Wells Fargo	15316	-15%	80746 0	mihaauthaaontaralatillah	15316 950 ⊢	

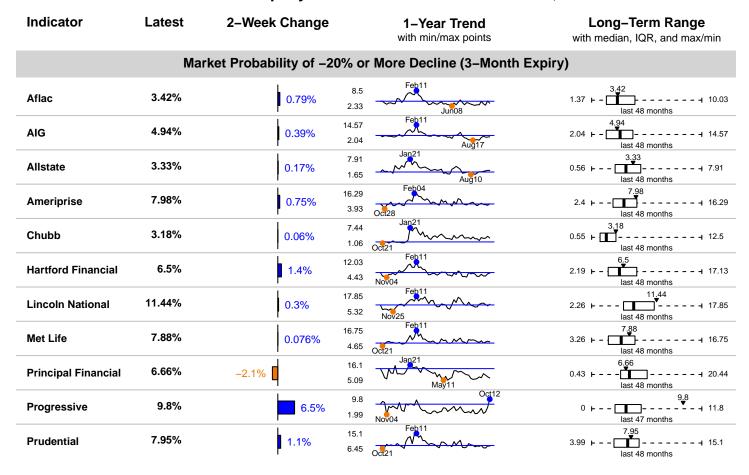
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Indicator	Latest	2-Week Change		1–Year Trend with min/max points	Long-Term Range with median, IQR, and max/min	
	MPD Standard Deviation (3–Month Expiry)					
Aflac	9.09%	0.64%	13.6 8.18	Feb11 Jun08	7.11 + - 14.27 last 48 months	
AIG	10.8%	0.62%	18.95 8.3	Feb11 Sep07	10.8 8.3 F - 10.8 last 48 months	
Allstate	9.1%	0.34%	13.18 7	Jan21 Aug24	9.1 5.83 F 13.18 last 48 months	
Ameriprise	13.25%	0.96%	18.71 10.02	Feb11	13.25 8.98 F 18.71 last 48 months	
Chubb	8.99%	0.29%	12.49 6.13	Feb11 Dec24	8.99 5.96 - 11 24.08 last 48 months	
Hartford Financial	12.44%	1.4%	18.69 10.39	Jan21 Sep07	8.35 F 12.44 last 48 months	
Lincoln National	15.92%	0.77%	22.48 11.47	Feb11 Nov25	15.92 8.98 	
Met Life	13.48%	0.42%	19.33 10.88	Feb11 Ct21	13,48 9.4 13 19.33 last 48 months	
Principal Financial	14.29%	-1.8%	18.94 10.92	Feb18 Aug31	14.29 8.02 F 14.29 last 48 months	
Progressive	13.75%	4.7%	13.75 8.06	Oct 12 10V04	13,75 5.79 F 11 19.73 last 47 months	
Prudential	13.44%	1%	18.54 12.39	Jan21 Sep28	13.44 10.09 F 18.54 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	-0.69	0.44	-0.47 Jan14 -1.31 Oct28	-0.69 -1.31 + 1.31	
AIG	-0.86	0.25	-0.32 Sep14 -1.16 Oct14	-0.86 -1.16 +	
Allstate	-0.99	0.37	-0.16 Oct14 -1.39 Sep07	-0.99 -1.5	
Ameriprise	-0.74	0.13	-0.32 Jan ⁰⁷ -1.47 Octo5	-0.74 -4.03 ⊢ 1 	
Chubb	-1.18	0.096	-0.38 Jan ⁰⁷ -1.65 Aug ³ 1	-1.18 -1.65 + 0.09 last 48 months	
Hartford Financial	-0.6	0.091	-0.16 -1.67 Nov04	-0.66 -1.67 -0.09 last 48 months	
Lincoln National	-0.68	0.21	-0.33 Apr06 -1.07 May04	-0.68 -1.15 + 1.15 1 0.15 last 48 months	
Met Life	-0.74	0.13	-0.51 Oct14 -1.24 Jun01	-0.74 -1.24 	
Principal Financial	-2.7	-0.44	0.42 Oct 1 -2.7 Oct 12	-2.7 -2.95 + 0.42 last 48 months	
Progressive	-0.22	0.76	-0.02 Dec02 -1.83 Oc28	-3.54 ⊢ 	
Prudential	-0.88	-0.01	-0.47 -1.2 Jan14 May18	-0.88 -1.44 F 	

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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	470	-64% [11177 0		470 88 - 1 22718 last 48 months	
AIG	10020	560%	44233 0	l.atradauluta.llt.laaatl.a	10020 110 Н — — — — — — — 103998 last 48 months	
Allstate	685	-45%	2467 0	aaldaallitti.a.raaal.raa.ltiraitti	685 63 - 11 10621 last 48 months	
Ameriprise	168	-45%	1035 0	ancistratodi haataaaadtataaddib	168 5 ⊢ 	
Chubb	184	-79%	6138 0		184 3 1 9027 last 48 months	
Hartford Financial	1019	68%	2769 0	dd.athumih.atiidahaini	1019 16 H∭ 1 14934 last 48 months	
Lincoln National	682	49%	4145 0	adaadankanadanadanan	682 51 +	
Met Life	3124	-34%	22250 0		3124 319 7 4100 last 48 months	
Principal Financial	100	89%	610 0	.uut.o.luuud.o.a.ult.duon.o	100 2 📲 1 2956 last 48 months	
Progressive	119	-76%	1798 0	عادال المالية	119 0 (111) 3415 last 47 months	
Prudential	2668	160%	14512 0	alaaatiiniidalalaaaatiinaaaaa	2668 222 + 1 17185 last 48 months	

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