

FEDERAL RESERVE BANK OF MINNEAPOLIS
BANKING AND POLICY STUDIES

Minneapolis Options Report – January 14

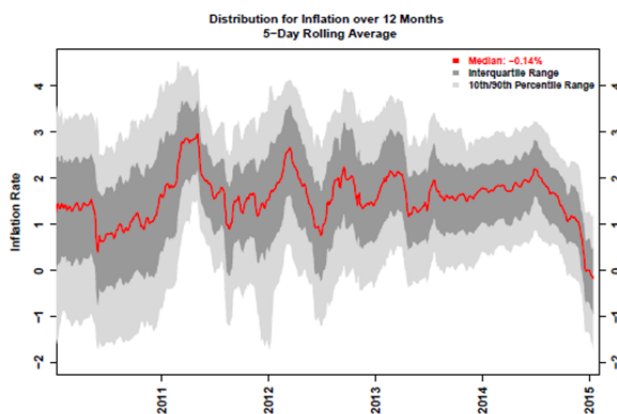
Please find a copy of a new paper on market-based probabilities on our website:

<https://www.minneapolisfed.org/banking/mpd/>. The paper discusses the usefulness for policymakers of market-based probabilities imputed from option prices. Feel free to share the link and/or provide comments to: option-report-feedback@mpls.frb.org.

The recent themes from our reporting on the options markets have not changed. The downward trajectory of median inflation rates from MPDs derived from puts and calls on the CPI remains in place. Treasury rate MPDs derived from options on 10 year notes continue to indicate bias toward lower rates. Physical commodity prices remain low or falling. Investors appear to have increased their desire for downside equity market protection given the MPD skew we measure from derived options on the S&P 500 index.

Inflation

- Median expectations for inflation from market-based probability distributions (MPDs) derived from caps and floors on the CPI, continued to decline over the past two weeks. The median expectations for CPI inflation over the next 1-year, 2-year, and 5-year horizons are at the lowest recorded levels since late 2009 when the cap and floor data became available. Moreover, the median expectation for CPI inflation over the next year again remained below 0% at -0.14%.



- Uncertainty regarding market-based CPI inflation expectations, measured by MPD standard deviations, remains at levels that are low relative to those observed over the past five years. However, MPD standard deviations for inflation have been slowly rising since mid-October, indicating declining conviction related to inflation rate expectations.
- As noted in the last report, measures of inflation MPD skew have been slowly rising over the past several months. Skew measures for all three of the inflation MPDs are above zero and the skew associated with the 5-year inflation MPD is approaching the 70th percentile of its historical distribution. Continued increases in the MPD skew could indicate a renewed bias towards higher expected inflation rates.

Interest Rates

- Short-term LIBOR rate expectations have followed inflation expectations lower. Market probabilities indicating low future LIBOR rates continue to rise. E.g., the market probability that 3-month LIBOR is below 1% five years from now has risen to 39% consistent with more skepticism about global growth.

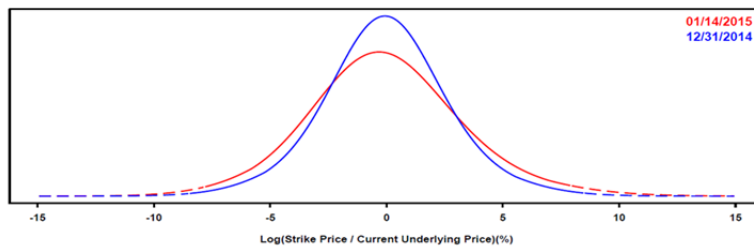


- MPD skews derived from options on 5 and 10-year Treasury futures rose along with MPD standard deviations and spot prices. This indicates more uncertainty about longer-term rate outcomes. At the same time, the higher skews show a bias toward lower rates. This bias is more prominent for the 10 year rate. Since the end of the year, the MPD derived from 10-year Treasury futures has skewed noticeably higher.

MARKET PROBABILITY DENSITY FUNCTIONS -- TEN YEAR TREASURY

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



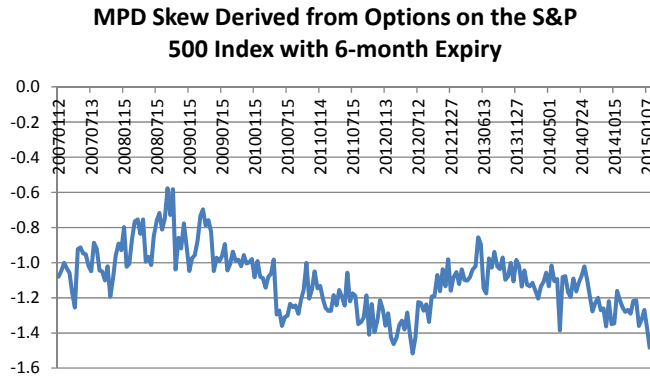
Banks and Insurance Companies

Tail risks as measured by MPD standard deviation rose uniformly across the financial sector firms we follow. This is consistent with the -2.3% S&P 500 performance. The average bank stock that we follow fell more than -6% and the average insurance company stock fell more than -5%.

- C and JPM reported disappointing earnings. Trading was active on for options on these two firms' equities though MPD changes were not significantly different from the rest of the industry.
- A few firms displayed elevated options trading that did not report earnings: BK, USB, LNC, and MET. MPD changes were similar to the rest of the industry.
- CS, DB, and UBS were noted as having positively skewed MPDs in our last report. Only DB outperformed the S&P 500 over the past two weeks. MPD skews for DB and UBS are now no longer upwardly skewed.

Other Commodity Markets

The S&P 500 price is near its all-time high. At the same time, the MPD skew derived from options on the index price is at an intermediate term low suggesting investors have increased their demand for downside protection.



Physical commodity prices continue to be weak and the dollar remains strong against European currencies. Trading was active for options on currencies, likely impacted by recent Swiss National Bank actions.

Additional Details:

- Trading in options on WTI crude oil was light again though this is consistent with the seasonal activity we see in the data. While spot prices fell another 7% over the past two weeks, the standard deviation of the MPD derived from options on crude oil futures fell -3.1% and the skew became less negative. This indicates a modest decline in tail risks and less downward price expectation.
- Similar to oil, spot prices for corn, soybeans, wheat, cattle, and hogs all declined. Unexpectedly, standard deviations associated with the MPDs derived from futures on these commodities also declined suggesting less tail risk.

On the other hand MPD skews for wheat, cattle, and hogs moved in the same direction as price suggesting that investors have increased their bias towards downside outcomes in these markets.

<i>MPD Statistics</i>					
2 week changes	corn	soybeans	wheat	cattle	hogs
Price	-2.7%	-1.0%	-8.3%	-4.7%	-5.1%
MPD St Dev	-1.4%	-0.8%	-1.0%	-0.2%	-0.33%
MPD Skew	0.063	0.021	-0.019	-0.058	-0.012

- Standard deviations increased slightly for MPDs derived from options on dollar-euro and dollar-pound futures indicating increased tail risk. We note that tail risks have been on the rise since summer.

Inflation MPD Statistics as of January 14, 2015

Indicator	Latest	2-Week Change	1-Year Trend with min/max points	Long-Term Range with median, IQR, and max/min
Inflation (1-Year Expiry)				
Median	-0.15%	-0.17%		
MPD Std Dev	1.13%	0.13%		
MPD Skew	0.2	0.21		
Market Prob of Less Than 1% Inflation	83%	1.5%		
Market Prob of More Than 3% Inflation	0.69%	0.36%		
Inflation (2-Year Expiry)				
Median	0.78%	-0.077%		
MPD Std Dev	1.08%	0.081%		
MPD Skew	0.21	0.08		
Market Prob of Less Than 1% Inflation	59.2%	2.6%		
Market Prob of More Than 3% Inflation	2.76%	0.42%		
Inflation (5-Year Expiry)				
Median	1.32%	-0.1%		
MPD Std Dev	0.97%	0.0055%		
MPD Skew	0.34	0.046		
Market Prob of Less Than 1% Inflation	35.24%	3.4%		
Market Prob of More Than 3% Inflation	5.06%	-0.72%		

Medium-to-Long Bond Price MPD Statistics as of January 14, 2015

Indicator	Latest	2-Week Change	1-Year Trend with min/max points	Long-Term Range with median, IQR, and max/min
5 Year Treasury (3-Month Expiry)				
Spot	120.71	1.5%	 120.71 118.05	 118.05 120.71 last 4 months
MPD Std Dev	2.02%	0.27%	 2.3 1.41	 1.41 2.3 last 4 months
MPD Skew	0.05	0.31	 0.36 -0.5	 -0.5 0.36 last 4 months
Market Prob of -3% or More Decline	6.51%	1.6%	 8.74 2.44	 2.44 8.74 last 4 months
Volume	214498	140%	 377550 0	 2054 377550 last 4 months
10 Year Treasury (3-Month Expiry)				
Spot	129.77	2.3%	 129.77 122.97	 122.97 129.77 last 15 months
MPD Std Dev	3.42%	0.65%	 3.8 2.17	 2.17 3.8 last 15 months
MPD Skew	0.21	0.15	 0.31 -0.38	 -0.75 0.31 last 15 months
Market Prob of -5% or More Decline	6.47%	2.8%	 8.48 1.62	 1.62 8.48 last 15 months
Volume	1047671	340%	 1047671 0	 5226 1047671 last 15 months

Short Interest Rates MPD Statistics as of January 14, 2015

Indicator	Latest	2-Week Change	1-Year Trend with min/max points	Long-Term Range with median, IQR, and max/min
3 Month LIBOR (3-Year Expiry)				
Median	1.21%	-0.46%		
MPD Std Dev	1.31%	-0.72%		
MPD Skew	1.11	-1.8		
Market Prob of Less Than 0.5% LIBOR	21.67%	6.4%		
Market Prob of More Than 1% + Spot	51.02%	-10%		
3 Month LIBOR (5-Year Expiry)				
Median	1.3%	-0.32%		
MPD Std Dev	1.87%	-0.19%		
MPD Skew	1.16	0.16		
Market Prob of Less Than 1% LIBOR	38.96%	6.6%		
Market Prob of More Than 2% + Spot	34.35%	-6.8%		

Equity Index MPD Statistics as of January 14, 2015

Indicator	Latest	2-Week Change	1-Year Trend with min/max points	Long-Term Range with median, IQR, and max/min
S&P 500 (6-Month Expiry)				
Spot	2011.27	-2.3%		
MPD Std Dev	13.46%	1.3%		
MPD Skew	-1.48	-0.21		
Market Prob of -20% or More Decline	8.34%	1.4%		
Volume	120603	180%		
S&P 500 (12-Month Expiry)				
Spot	2011.27	-2.3%		
MPD Std Dev	19.3%	0.98%		
MPD Skew	-1.4	-0.14		
Market Prob of -20% or More Decline	14.07%	0.59%		
Volume	62409	140%		
iShares US Real Estate Index (3-Month Expiry)				
Spot	80.88	5.3%		
MPD Std Dev	7.63%	0.43%		
MPD Skew	-0.91	-0.18		
Market Prob of -10% or More Decline	10.41%	2.4%		
Volume	9527	-39%		

Exchange Rate MPD Statistics as of January 14, 2015

Indicator	Latest	2-Week Change	1-Year Trend with min/max points	Long-Term Range with median, IQR, and max/min
Dollar-Euro Futures (3-Month Expiry)				
Spot	1.18	-2.5%		
MPD Std Dev	4.98%	0.11%		
MPD Skew	-0.26	0.029		
Market Prob of -10% or More Decline	3.05%	0.1%		
Volume	41341	71%		
Dollar-Pound Futures (3-Month Expiry)				
Spot	152.14	-2.3%		
MPD Std Dev	3.89%	0.17%		
MPD Skew	-0.43	-0.0023		
Market Prob of -10% or More Decline	1.3%	0.23%		
Volume	10405	630%		
Dollar-Yen Futures (3-Month Expiry)				
Spot	85.33	2.2%		
MPD Std Dev	5.44%	-0.39%		
MPD Skew	0.14	0.22		
Market Prob of -10% or More Decline	3.15%	-1.7%		
Volume	11968	160%		

Metal and Energy Commodity MPD Statistics as of January 14, 2015

Indicator	Latest	2-Week Change	1-Year Trend with min/max points	Long-Term Range with median, IQR, and max/min
Gold (6-Month Expiry)				
Spot	1235.52	4.3%		
MPD Std Dev	12.04%	-0.69%		
MPD Skew	-0.27	0.11		
Market Prob of -20% or More Decline	5.72%	-1.1%		
Volume	8725	93%		
Silver (6-Month Expiry)				
Spot	17.02	9.1%		
MPD Std Dev	21.09%	0.1%		
MPD Skew	-0.22	0.25		
Market Prob of -20% or More Decline	17.22%	1.9%		
Volume	2659	190%		
West Texas Intermediate Crude (6-Month Expiry)				
Spot	51.69	-6.8%		
MPD Std Dev	29.43%	-3.1%		
MPD Skew	-0.54	0.18		
Market Prob of -20% or More Decline	23.85%	0.2%		
Volume	6486	-90%		

Agricultural Crop Commodity MPD Statistics as of January 14, 2015

Indicator	Latest	2-Week Change	1-Year Trend with min/max points	Long-Term Range with median, IQR, and max/min
Corn (6-Month Expiry)				
Spot	395.07	-2.7%		
MPD Std Dev	16.83%	-1.4%		
MPD Skew	0.15	0.063		
Market Prob of -20% or More Decline	12.5%	-1.4%		
Volume	32974	120%		
Soybeans (6-Month Expiry)				
Spot	1018.78	-1%		
MPD Std Dev	15.69%	-0.8%		
MPD Skew	-0.19	0.021		
Market Prob of -20% or More Decline	11.12%	-0.47%		
Volume	30470	51%		
Wheat (6-Month Expiry)				
Spot	544.52	-8.3%		
MPD Std Dev	17.44%	-1%		
MPD Skew	0.18	-0.019		
Market Prob of -20% or More Decline	13.74%	-0.61%		
Volume	16319	780%		

Agricultural Livestock Commodity MPD Statistics as of January 14, 2015

Indicator	Latest	2-Week Change	1-Year Trend with min/max points	Long-Term Range with median, IQR, and max/min
Cattle (6-Month Expiry)				
Spot	147.59	-4.7%		
MPD Std Dev	11.5%	-0.15%		
MPD Skew	-0.66	-0.058		
Market Prob of -5% or More Decline	28.37%	-0.91%		
Volume	15352	11%		
Hogs (6-Month Expiry)				
Spot	86.92	-5.1%		
MPD Std Dev	14.57%	-0.33%		
MPD Skew	0.16	-0.012		
Market Prob of -5% or More Decline	41.16%	0.87%		
Volume	572	-63%		

Bank MPD Statistics as of January 14, 2015

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)				
American Express	11.59%	1.5%		
Bank of America	13.87%	2.5%		
BB&T	11.59%	2.3%		
Barclays	16.37%	2.4%		
Bank of NY Mellon	11.6%	1.4%		
Citigroup	14.09%	3%		
Capital One	12.14%	2.8%		
Credit Suisse	14.98%	0.7%		
Deutsche Bank	17.44%	3.2%		
Fifth Third	12.74%	3%		
Goldman Sachs	12.49%	1.7%		
JP Morgan	12.44%	2.5%		
Keycorp	14.5%	2.6%		
Morgan Stanley	14.65%	2.5%		
PNC Financial	11.2%	2.8%		
Regions Financial	13.87%			
SunTrust	12.67%	1.5%		
State Street	12.62%	2.1%		
UBS	13.36%	2.5%		
US Bancorp	10.65%	2.3%		
Wells Fargo	11.25%	2.1%		

Bank MPD Statistics as of January 14, 2015

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	-0.57	0.0096		
Bank of America	-0.6	-0.26		
BB&T	-0.96	-0.26		
Barclays	-0.77	0.17		
Bank of NY Mellon	-0.47	0.23		
Citigroup	-0.58	0.056		
Capital One	-0.69	-0.076		
Credit Suisse	0.46	0.078		
Deutsche Bank	-0.35	-0.64		
Fifth Third	-0.25	0.32		
Goldman Sachs	-0.66	0.057		
JP Morgan	-0.73	0.033		
Keycorp	-0.37	0.38		
Morgan Stanley	-0.67	-0.057		
PNC Financial	-0.73	-0.081		
Regions Financial	-0.78			
SunTrust	-0.48	0.11		
State Street	-0.71	-0.38		
UBS	-0.04	-0.94		
US Bancorp	-0.87	-0.28		
Wells Fargo	-0.89	-0.045		

Bank MPD Statistics as of January 14, 2015

Indicator	Latest	2-Week Change	1-Year Trend with min/max points	Long-Term Range with median, IQR, and max/min
Market Probability of -20% or More Decline (3-Month Expiry)				
American Express	6%	2.1%	7.79 1.53 Oct15 Aug28	1.53 - 6 - 17.67 last 48 months
Bank of America	8.69%	3.8%	10.91 3.13 Oct15 Jul03	3.13 - 8.69 - 27.24 last 48 months
BB&T	5.79%	2.6%	8.19 1.82 Oct15 Aug21	1.82 - 5.79 - 34.9 last 48 months
Barclays	11.68%	3.7%	18.72 5.5 Oct15 Nov05 Sep24	5.5 - 11.68 - 30.94 last 48 months
Bank of NY Mellon	6.02%	2.3%	8.35 1.72 Oct15 Jul31	1.72 - 6.02 - 21.34 last 48 months
Citigroup	8.19%	3.5%	9.93 1.93 Oct15 Jul24	1.93 - 8.19 - 24.59 last 48 months
Capital One	6.64%	3.3%	7.94 1.64 Oct15 Jul24	1.64 - 6.64 - 21.29 last 48 months
Credit Suisse	9.27%	0.49%	12.84 2.87 Oct15 May15 Nov26	2.87 - 9.27 - 28.61 last 48 months
Deutsche Bank	14.36%	4.7%	14.97 5.74 Oct15 Jan07 Aug28	4.99 - 14.36 - 29.63 Last time higher Jun2013
Fifth Third	8.2%	5.1%	11.8 0.99 Oct15 May01 Oct29	0.99 - 8.2 - 21.5 last 48 months
Goldman Sachs	6.7%	2%	8.27 1.79 Oct15 Jun05	1.79 - 6.7 - 21.46 last 48 months
JP Morgan	6.7%	2.4%	6.95 1.31 Oct15 Jul24	1.31 - 6.7 - 20.52 last 48 months
Keycorp	9.67%	3.9%	9.67 1.92 Oct15 Jan14 Nov26	1.92 - 9.67 - 27.26 Last time higher Dec2012
Morgan Stanley	9.57%	3.2%	13.03 3.21 Oct15 Nov26	3.21 - 9.57 - 26.47 last 48 months
PNC Financial	6.52%	4.3%	6.52 1.43 Oct15 Jan14 Sep04	1.43 - 6.52 - 17.91 Last time higher Jan2013
Regions Financial	7.82%		14.66 4.26 Oct15 Sep10 Oct29	3.64 - 7.82 - 29.69 last 47 months
SunTrust	8.19%	2.8%	10.15 1.73 Oct15 May08	1.73 - 8.19 - 26.4 last 48 months
State Street	7.31%	3.6%	9.04 2.23 Oct15 Dec24 Sep04	2.23 - 7.31 - 19.69 Last time higher Jun2013
UBS	7.28%	5.7%	18.15 1.53 Oct15 Mar06 Dec31	1.53 - 7.28 - 27.33 48 month low
US Bancorp	4.44%	2.2%	6.91 0.74 Oct15 Jul24	0.74 - 4.44 - 18.85 last 48 months
Wells Fargo	5.6%	2.4%	7.53 1.3 Oct15 Jun05	1.3 - 5.6 - 20.71 last 48 months

Bank MPD Statistics as of January 14, 2015

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	2532	5.7%	10151 0	623 - 2532 - 20941 last 48 months
Bank of America	65841	-3.2%	132589 0	7419 - 65841 - 363160 last 48 months
BB&T	1856	140%	6490 0	190 - 1856 - 6903 last 48 months
Barclays	411	-47%	11011 0	13 - 411 - 15208 last 48 months
Bank of NY Mellon	13099	4200%	15678 0	59 - 13099 - 17091 last 48 months
Citigroup	66634	420%	82455 0	1104 - 66634 - 192846 last 48 months
Capital One	2193	420%	6644 0	164 - 2193 - 16299 last 48 months
Credit Suisse	7136	1100%	15145 0	0 - 7136 - 15145 last 48 months
Deutsche Bank	3447	-36%	25112 0	62 - 3447 - 29575 last 48 months
Fifth Third	843	-49%	6299 0	28 - 843 - 19127 last 48 months
Goldman Sachs	3952	230%	21840 0	296 - 3952 - 43413 last 48 months
JP Morgan	52941	260%	52941 0	943 - 52941 - 119246 last 48 months
Keycorp	1004	340%	3014 0	44 - 1004 - 76270 last 48 months
Morgan Stanley	4575	130%	48955 0	327 - 4575 - 84281 last 48 months
PNC Financial	1282	130%	4810 0	83 - 1282 - 12224 last 48 months
Regions Financial	1554		4635 0	20 - 1554 - 19649 last 47 months
SunTrust	872	70%	4232 0	61 - 872 - 13788 last 48 months
State Street	150	-86%	5339 0	42 - 150 - 5370 last 48 months
UBS	124	20%	2034 0	6 - 124 - 6502 last 48 months
US Bancorp	9006	150%	9006 0	172 - 9006 - 29201 last 48 months
Wells Fargo	15330	390%	62697 0	950 - 15330 - 167820 last 48 months

Insurance Company MPD Statistics as of January 14, 2015

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	10.28%	1.6%		
AIG	12.18%	2.2%		
Allstate	8.74%	-0.0062%		
Ameriprise	11.93%	-0.27%		
Chubb	8.37%	-0.84%		
Hartford Financial	11.48%	1.4%		
Lincoln National	14.68%	2.3%		
Met Life	13.8%	2.6%		
Principal Financial	12.84%	0.85%		
Progressive	9.64%			
Prudential	14.04%	2.8%		

Insurance Company MPD Statistics as of January 14, 2015

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	-0.86	-0.17		
AIG	-0.5	-0.27		
Allstate	-0.89	-0.0072		
Ameriprise	-0.37	-0.26		
Chubb	-0.89	0.014		
Hartford Financial	-0.86	0.098		
Lincoln National	-0.57	0.18		
Met Life	-0.55	0.053		
Principal Financial	-0.46	-0.28		
Progressive	-0.13			
Prudential	-0.52	0.24		

Insurance Company MPD Statistics as of January 14, 2015

Indicator	Latest	2-Week Change	1-Year Trend with min/max points	Long-Term Range with median, IQR, and max/min
Market Probability of -20% or More Decline (3-Month Expiry)				
Aflac	4.65%	2.3%		
AIG	7.26%	4.1%		
Allstate	3.06%	0.1%		
Ameriprise	6.24%	0.48%		
Chubb	2.71%	-1%		
Hartford Financial	5.26%	1%		
Lincoln National	10.95%	4.2%		
Met Life	7.8%	2.6%		
Principal Financial	7.04%	0.48%		
Progressive	2.83%			
Prudential	9.75%	4.3%		

Insurance Company MPD Statistics as of January 14, 2015

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	2478	78%	13324 0	2478 405 - [] - 22718 last 48 months
AIG	7407	230%	38744 0	7407 432 - [] - 103998 last 48 months
Allstate	797	520%	5708 0	797 76 - [] - 68926 last 48 months
Ameriprise	127	110%	1071 0	127 5 - [] - 1114 last 48 months
Chubb	441	570%	2541 0	441 11 - [] - 11114 last 48 months
Hartford Financial	711	150%	13441 0	711 65 - [] - 37285 last 48 months
Lincoln National	2635	810%	8403 0	2635 51 - [] - 10682 last 48 months
Met Life	22304	1100%	29248 0	22304 319 - [] - 161416 last 48 months
Principal Financial	59	-58%	310 0	59 2 - [] - 3846 last 48 months
Progressive	56		474 0	56 0 - [] - 4283 last 47 months
Prudential	2870	410%	13225 0	2870 222 - [] - 13225 last 48 months