

FEDERAL RESERVE BANK OF MINNEAPOLIS
BANKING AND POLICY STUDIES

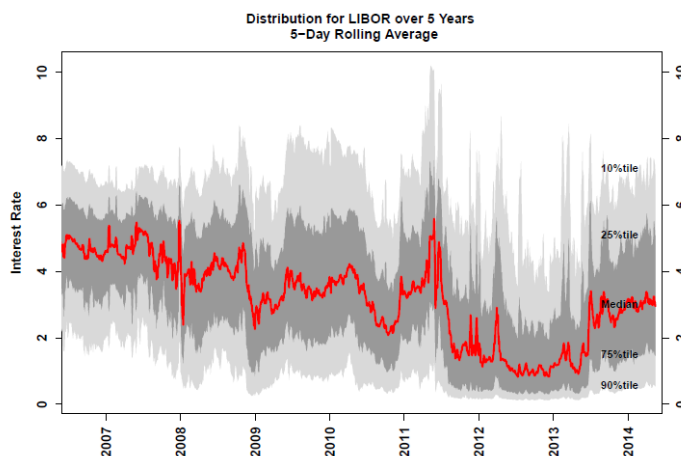
Minneapolis Options Report – May 15th

This week we separately include new reports of inflation RNPDs derived from caps and floors. For each expiry (1 year, 2 years, and 5 years) we present four graphs: (1) a time series of risk neutral probability of inflation >3% and <1%; (2) a time series of the inflation rate at various quantiles of the distribution; (3) a time series of the interquartile range (variance) and quantile skew; (4) a comparison of the current distribution relative to the distribution 3 months ago.

Inflation and Interest Rates

Inflation: Over the next one and two year periods, the risk neutral probability of inflation below 1% continues to fall. The dispersion of outcomes also continues to decline. Five year statistics remain well-anchored.

LIBOR rates: Risk neutral probabilities for rates below 50 basis points continue to fall and for a 100 basis point increase continue to rise at both two and five year expiries. The five year median is near 3% and the distribution is skewed upwards.



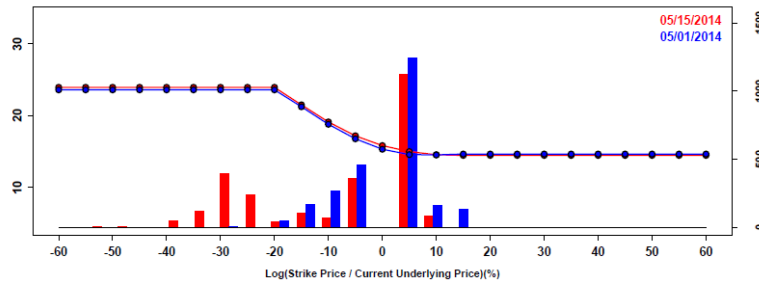
Banks & Insurance Companies

Over the past two weeks the average CCAR 17 bank underperformed the S&P 500 by -85 basis points. The average of our 11 insurance companies underperformed the S&P 500 by -100 basis points. The average RNPD standard deviation increased for both groups, indicating a rise in tail risk relative to two weeks ago. Options trading was relatively light for both groups.

- There was some interesting trading in WFC options with noticeable volumes more than -20% out of the money (see red bars in the chart below) potentially an indication of investors purchasing protection. The stock price fell only -120 basis points over the past two weeks outperforming its peers. (See WFC report)

Options Data: Wells Fargo

Implied Volatilities (lines--left axis) and Volume (bars--right axis)



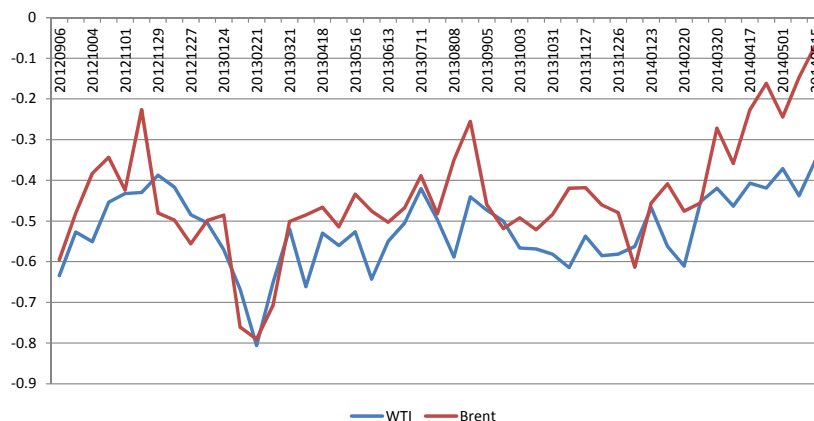
- We registered out of the money trading for AXP similar to that of WFC. (See AXP report)

Other Commodity Markets

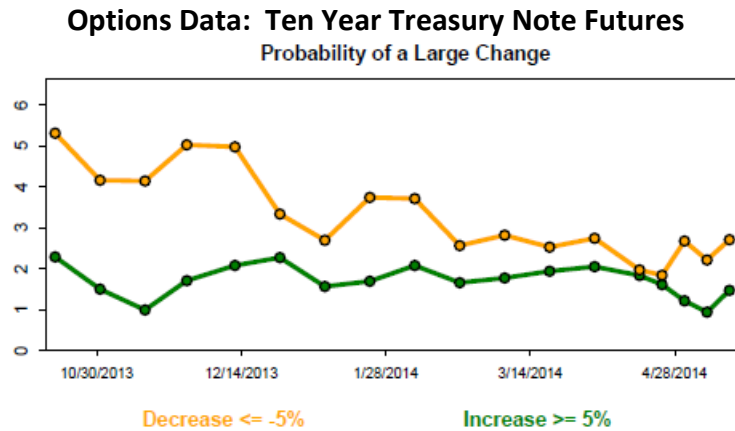
The S&P 500 fell -70 basis points over the last two weeks and the standard deviation of the RNPD derived from options on the index rose about 80 basis points indicating increased tail risk in the stock market. Trading for options on other commodities was generally light. The direction of tail risk, as measured by RNPD standard deviation in the physical commodity markets (grains, cattle, metals, oil) was down.

- Grain prices dropped over the past two weeks. Corn and wheat were especially weak falling -4.3% and -4.1% respectively. RNPD standard deviations fell for all three commodities a sign of reduced tail risk. We note parallel shifts lower in the volatility smiles of each of these commodities. (See corn, soybeans, and wheat reports)
- Spot prices in the oil markets reversed about 150 basis points of their -250 basis point decline reported two weeks ago. At the same time, RNPD standard deviations fell for distributions derived from options on WTI and Brent crude futures. RNPD skews from the oil markets continue their rising trends indicating less expectation of downside price moves. (See WT and Brent reports)

RNPD Skews Derived from Options on Oil Futures



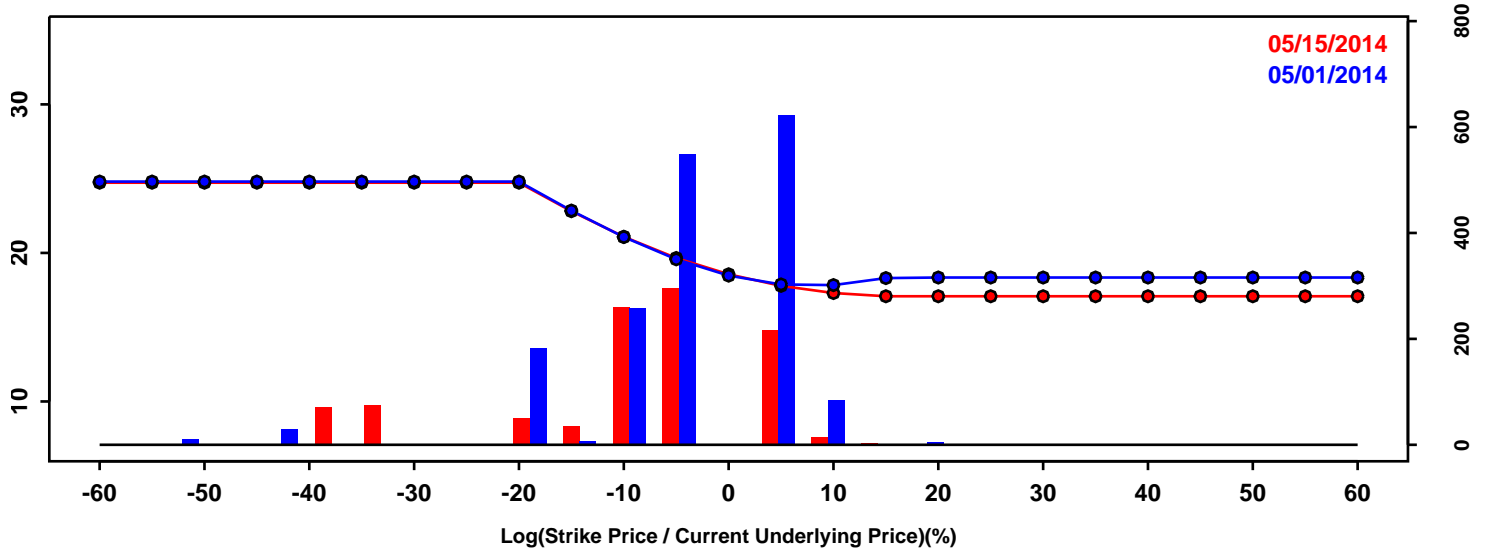
- The skew of the RNPD derived from futures on the exchange rate between the dollar and yen moved in the direction of a strengthening yen. Trading in options on exchange rate futures was strong last week. (*See exchange rate reports*)
- Over the past 4 weeks the RNPD skew derived from options on ten year treasury futures prices has become more negative indicating increased expectations for rising yields (which move in the opposite direction of prices). (*See Ten Year Treasury Report*)



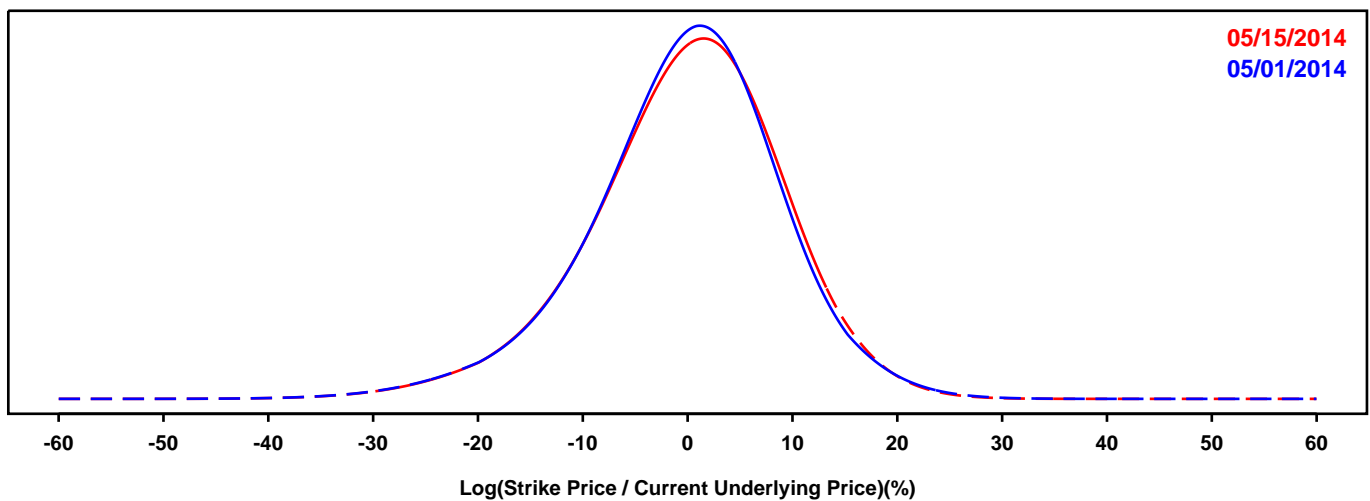
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- AMERICAN EXPRESS

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

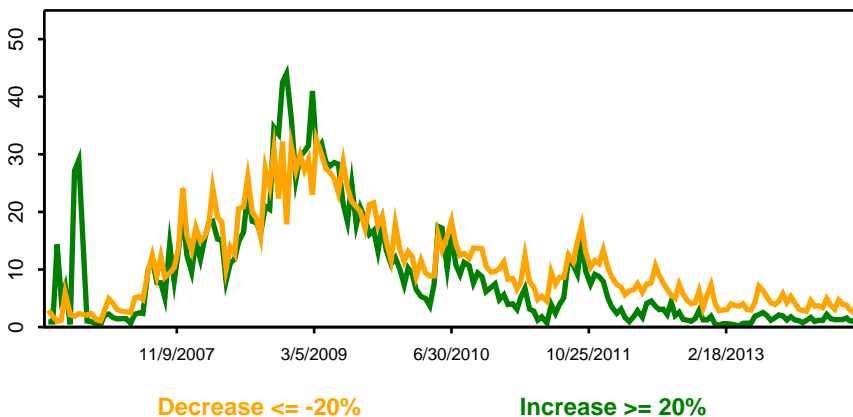
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

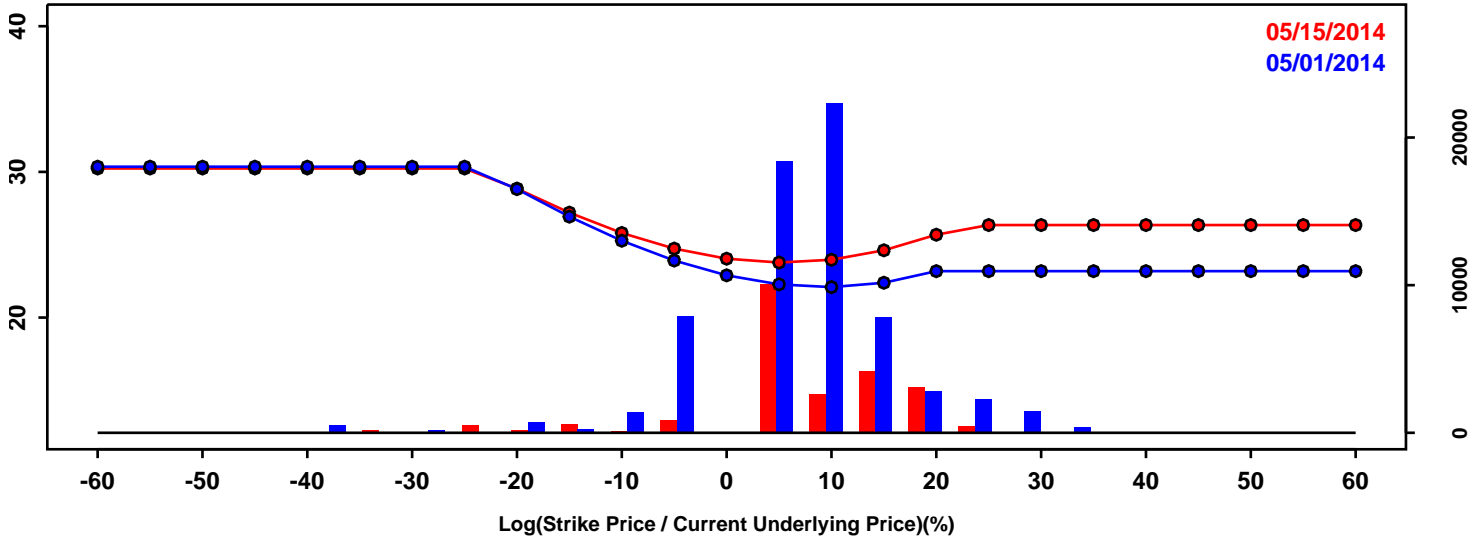


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-12.09%	-12.11%	-0.02%
50th Pct	0.29%	0.48%	0.19%
90th Pct	10.65%	10.99%	0.34%
Mean	-0.30%	-0.12%	0.18%
Std Dev	9.27%	9.32%	0.05%
Skew	-0.42	-0.45	-0.03
Kurtosis	0.83	0.69	-0.14

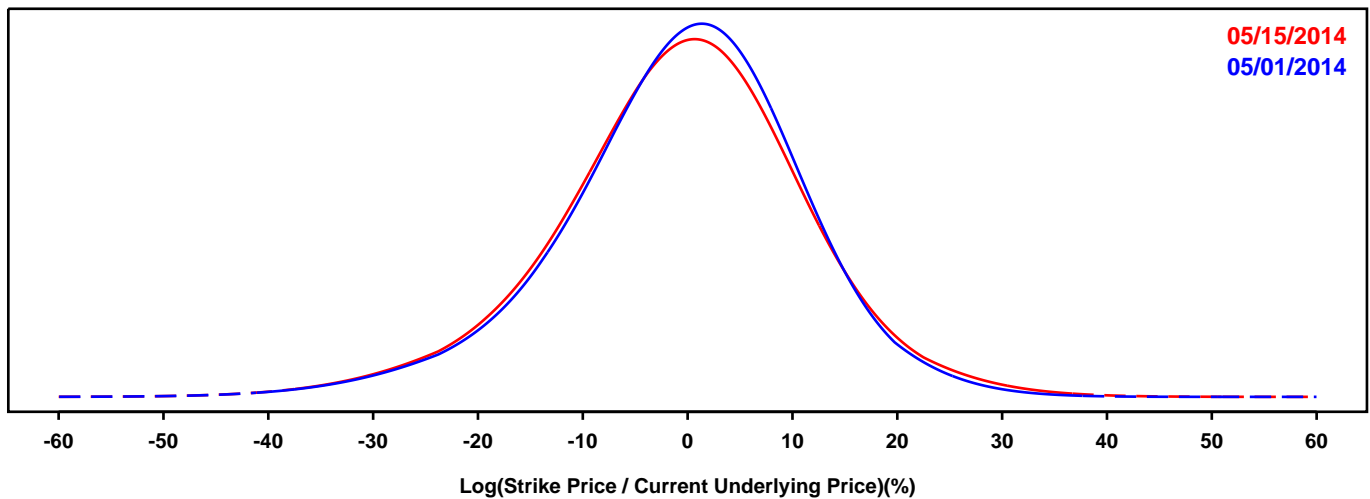
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- BANK OF AMERICA

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

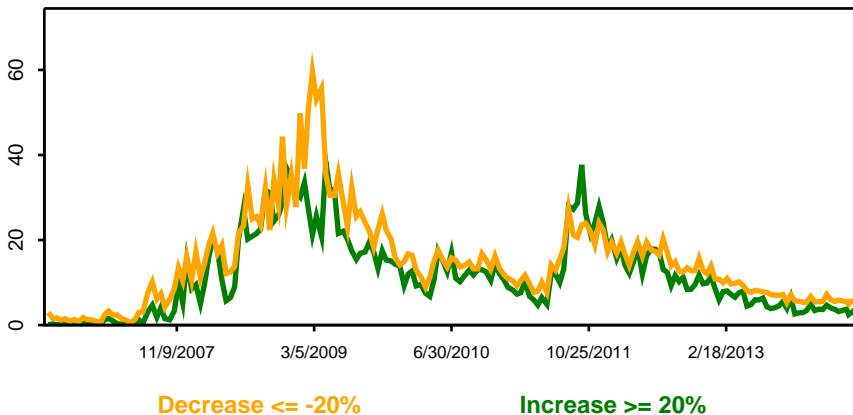
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

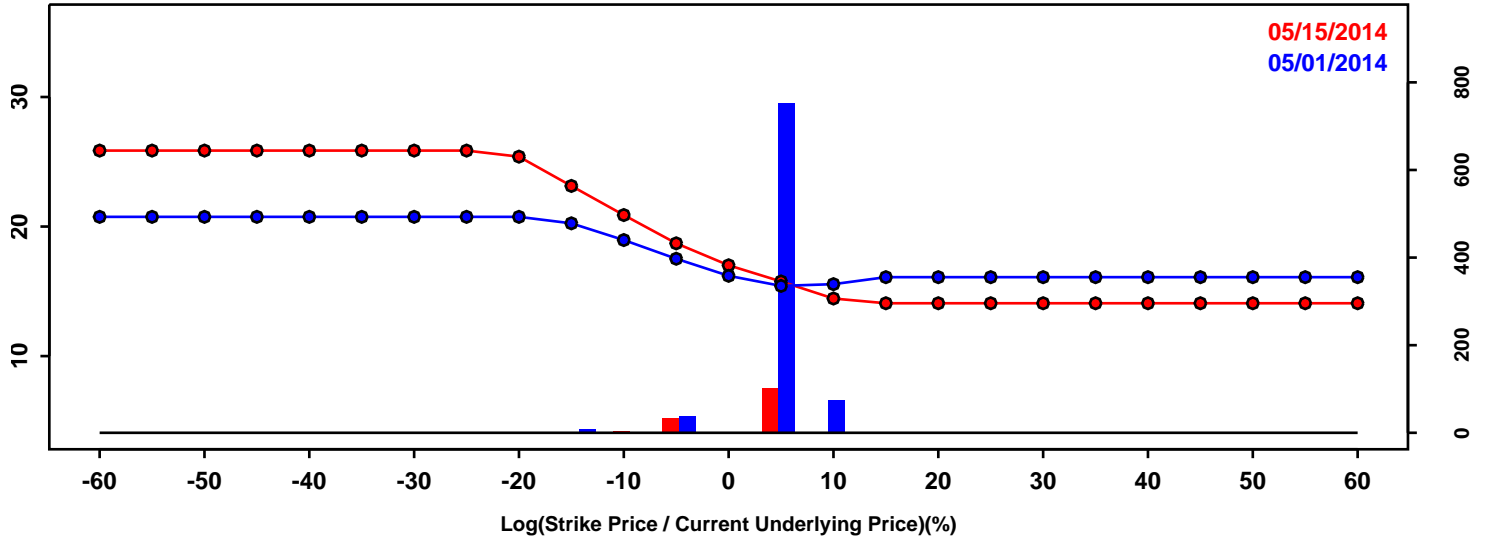


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-15.23%	-15.78%	-0.55%
50th Pct	0.17%	-0.13%	-0.30%
90th Pct	13.11%	13.81%	0.70%
Mean	-0.53%	-0.60%	-0.08%
Std Dev	11.55%	12.03%	0.48%
Skew	-0.41	-0.25	0.16
Kurtosis	0.80	0.72	-0.08

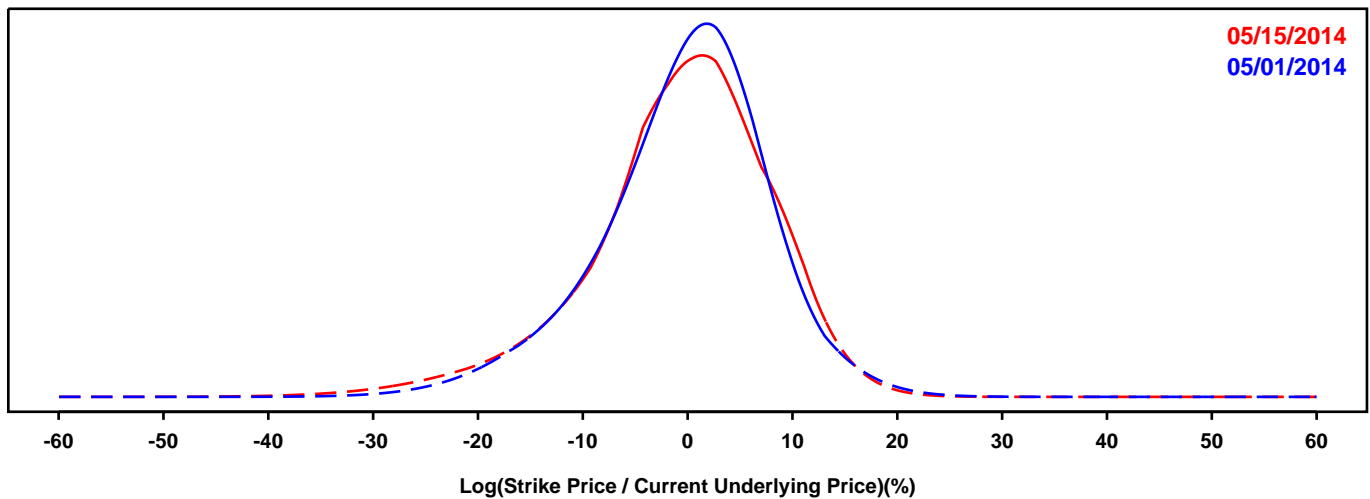
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- BB&T

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

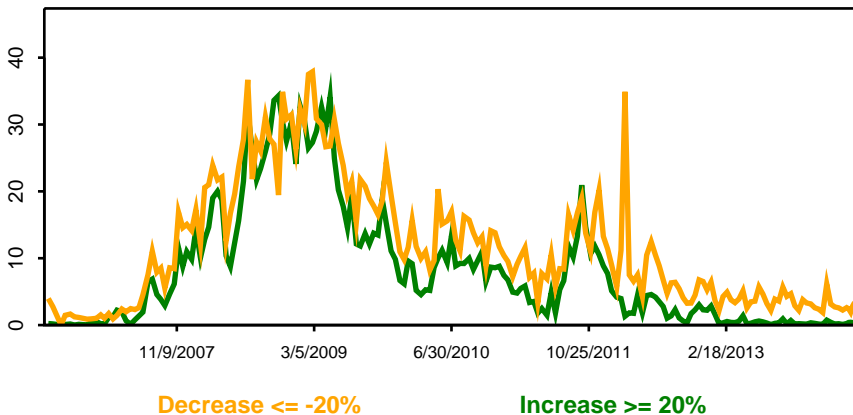
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

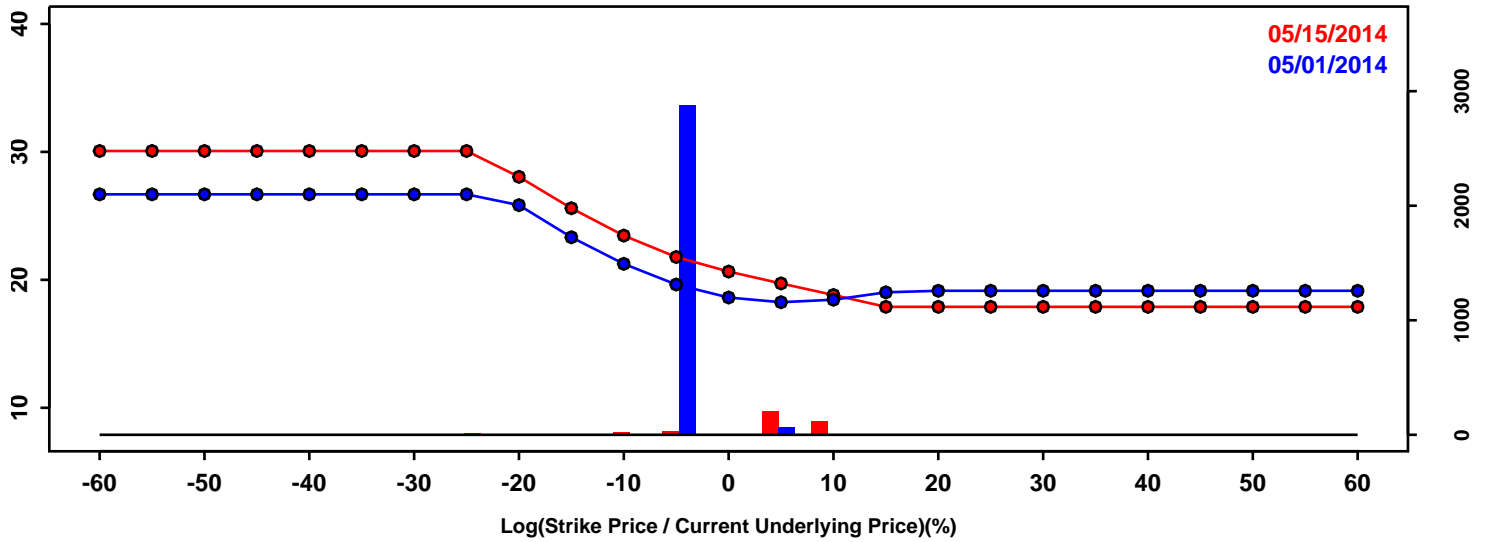


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-11.07%	-12.18%	-1.12%
50th Pct	0.42%	0.15%	-0.27%
90th Pct	9.11%	9.61%	0.50%
Mean	-0.31%	-0.73%	-0.42%
Std Dev	8.16%	8.90%	0.74%
Skew	-0.48	-0.77	-0.29
Kurtosis	0.75	1.29	0.54

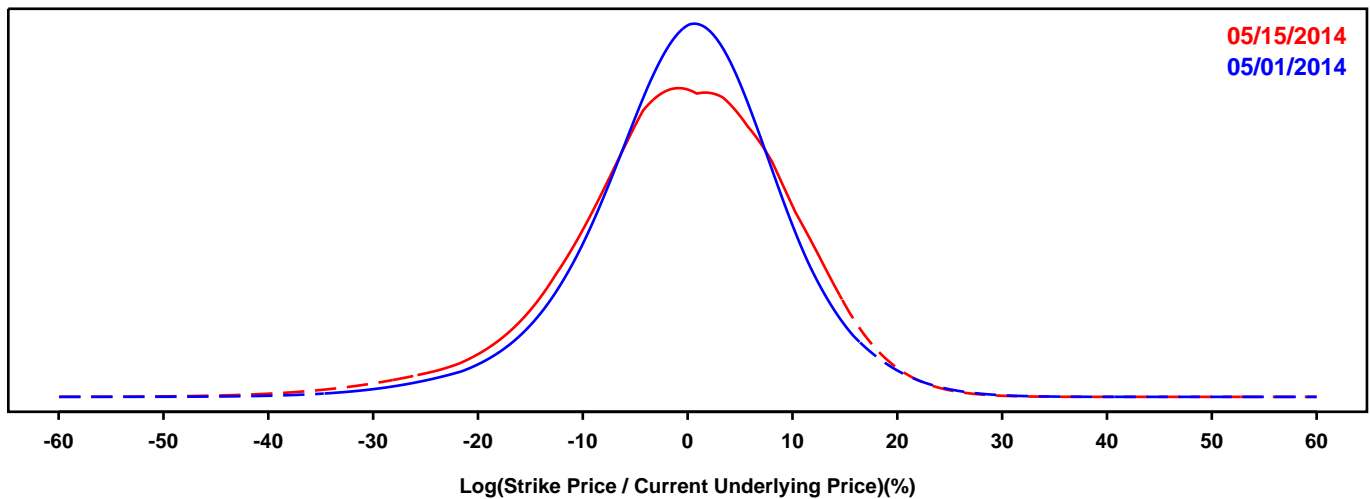
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- BANK OF NEW YORK MELLON

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

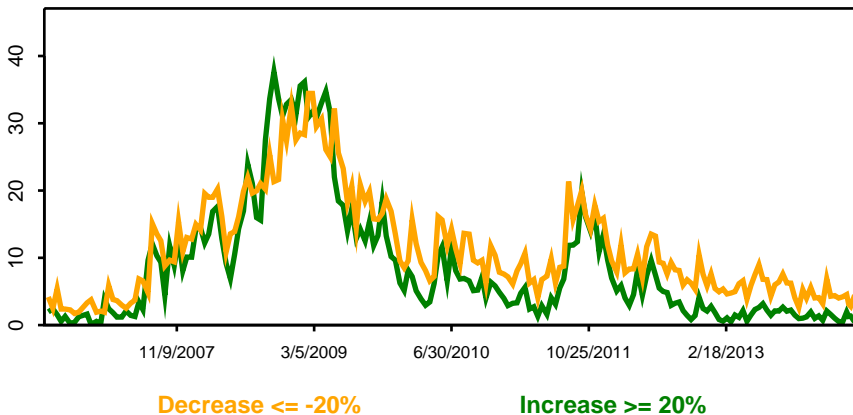
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

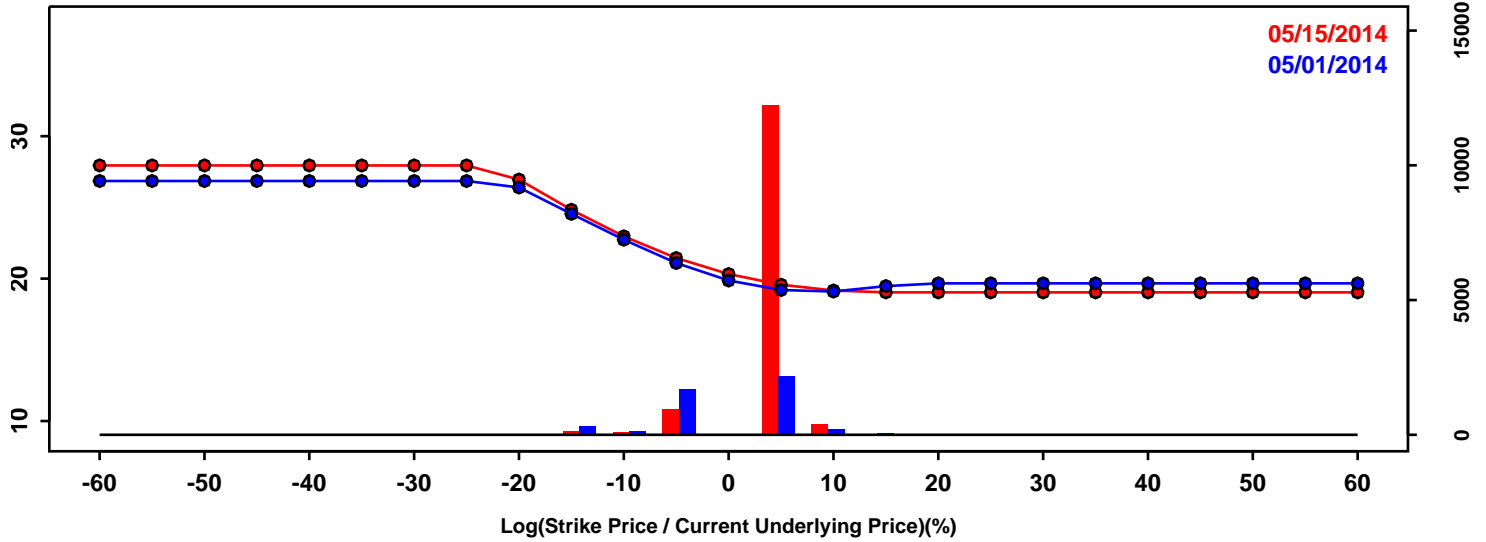


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-11.79%	-13.78%	-1.99%
50th Pct	0.24%	-0.11%	-0.35%
90th Pct	10.95%	11.85%	0.90%
Mean	-0.19%	-0.72%	-0.54%
Std Dev	9.34%	10.48%	1.14%
Skew	-0.38	-0.57	-0.18
Kurtosis	1.04	1.00	-0.04

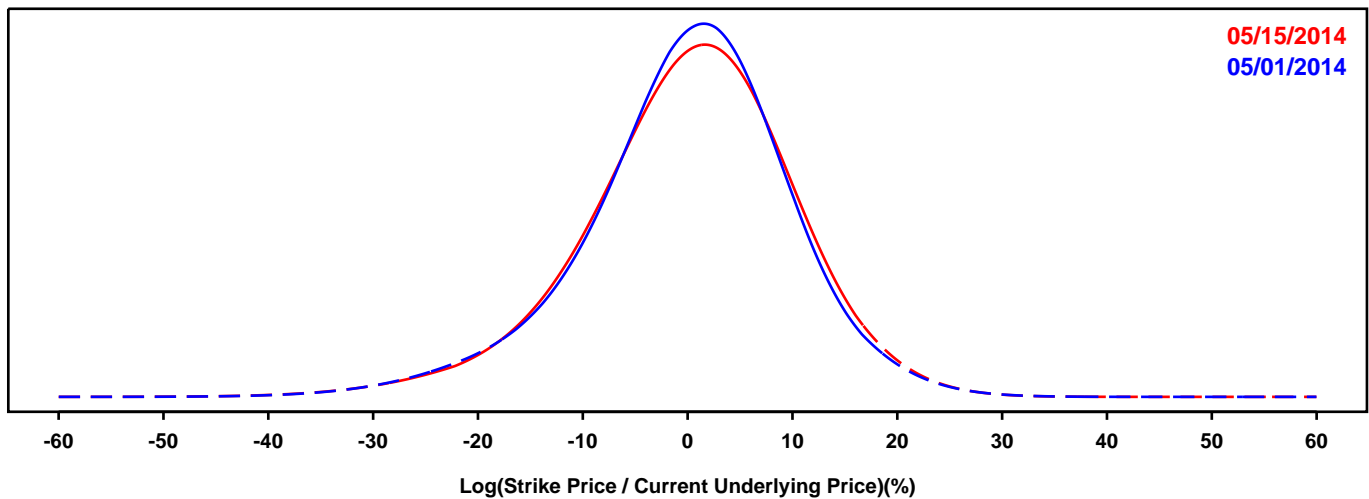
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- CITIGROUP

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

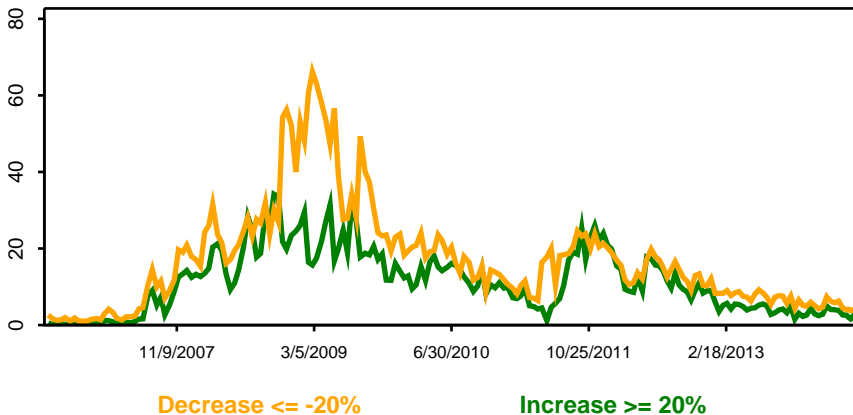
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

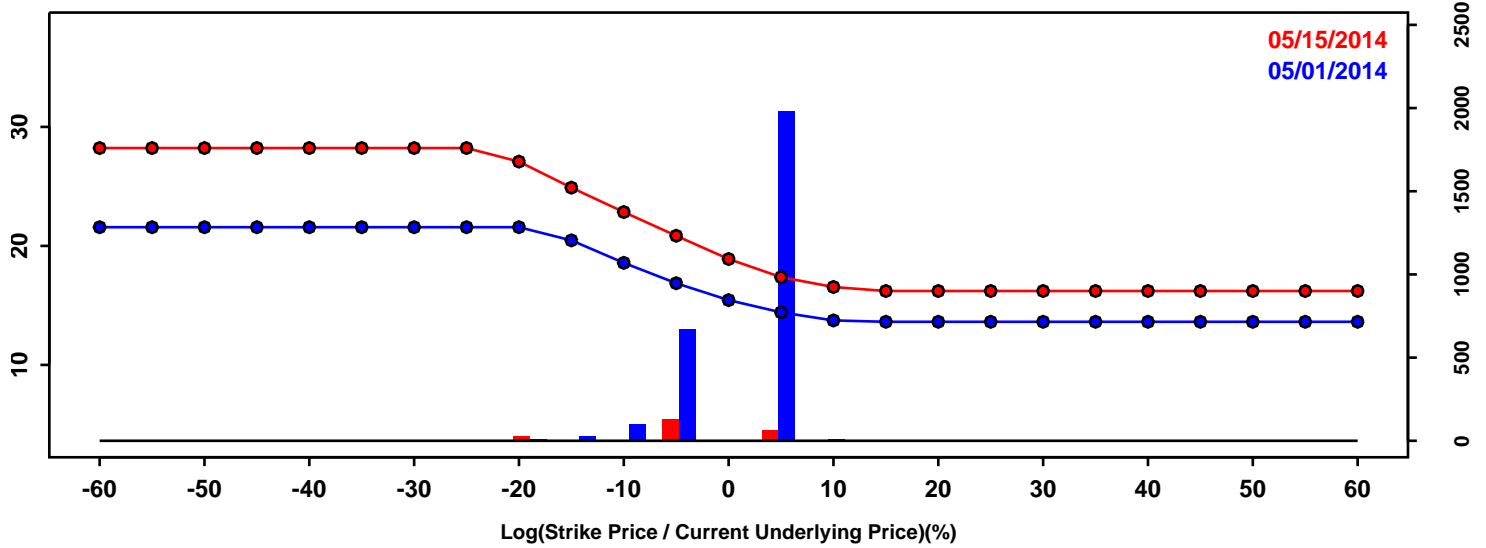


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-12.79%	-12.82%	-0.02%
50th Pct	0.58%	0.69%	0.11%
90th Pct	11.61%	12.19%	0.59%
Mean	-0.09%	0.08%	0.17%
Std Dev	9.99%	10.18%	0.19%
Skew	-0.47	-0.46	0.01
Kurtosis	0.94	0.83	-0.11

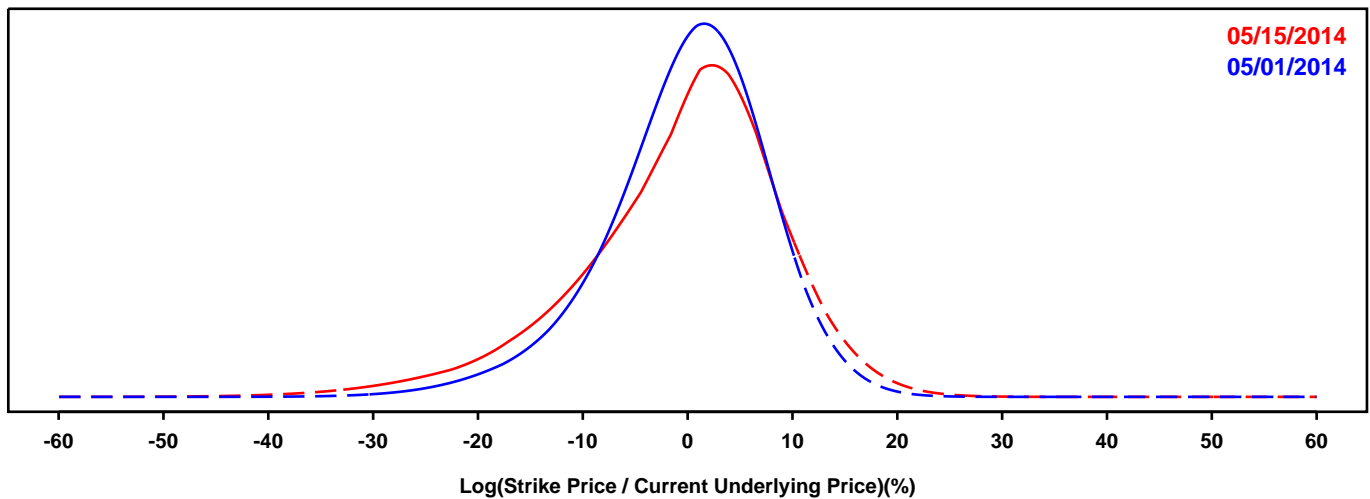
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- CAPITAL ONE

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

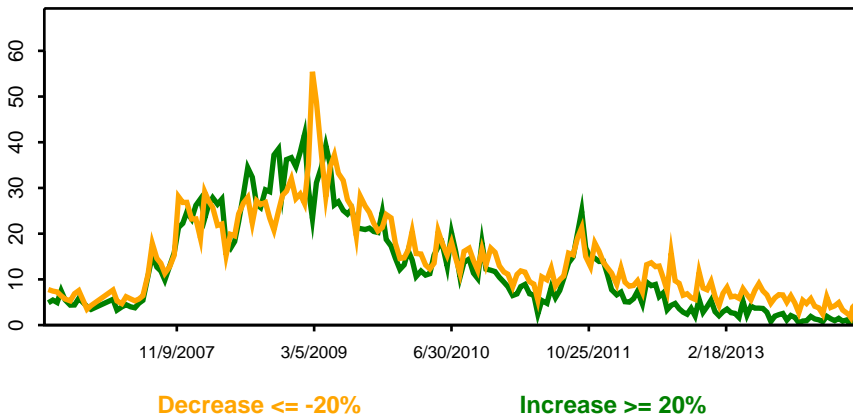
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

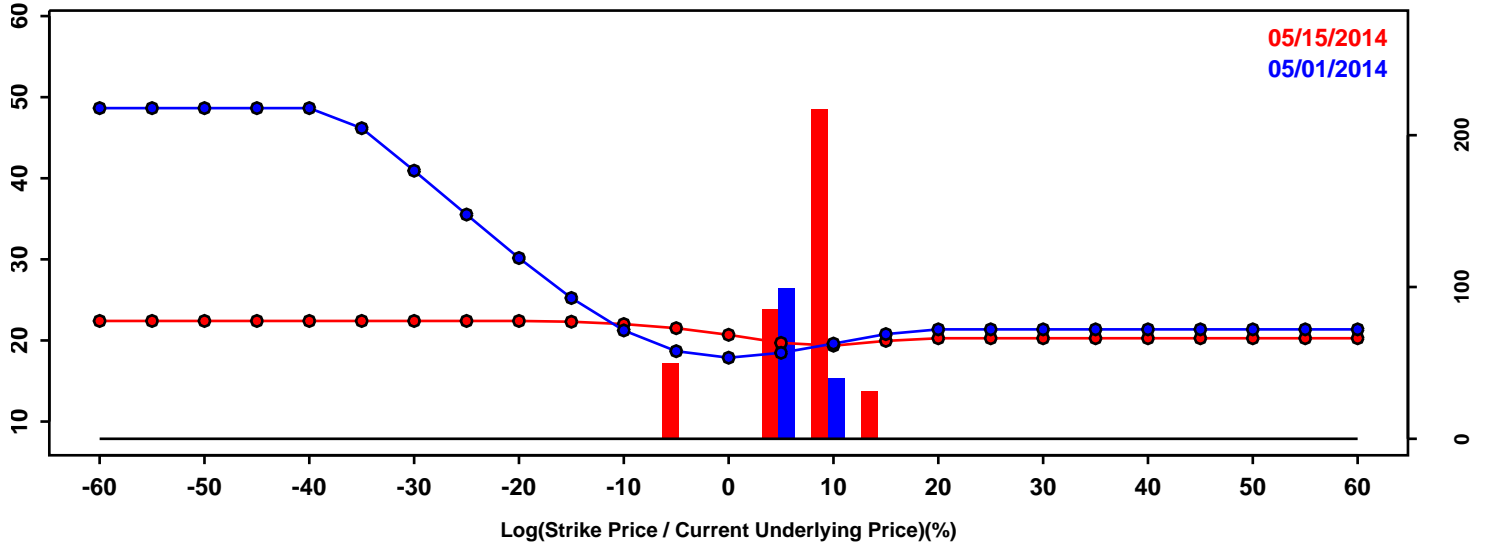


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-10.22%	-13.64%	-3.42%
50th Pct	0.60%	0.68%	0.08%
90th Pct	9.11%	10.32%	1.21%
Mean	-0.05%	-0.68%	-0.63%
Std Dev	7.82%	9.81%	1.99%
Skew	-0.59	-0.79	-0.21
Kurtosis	0.88	1.24	0.36

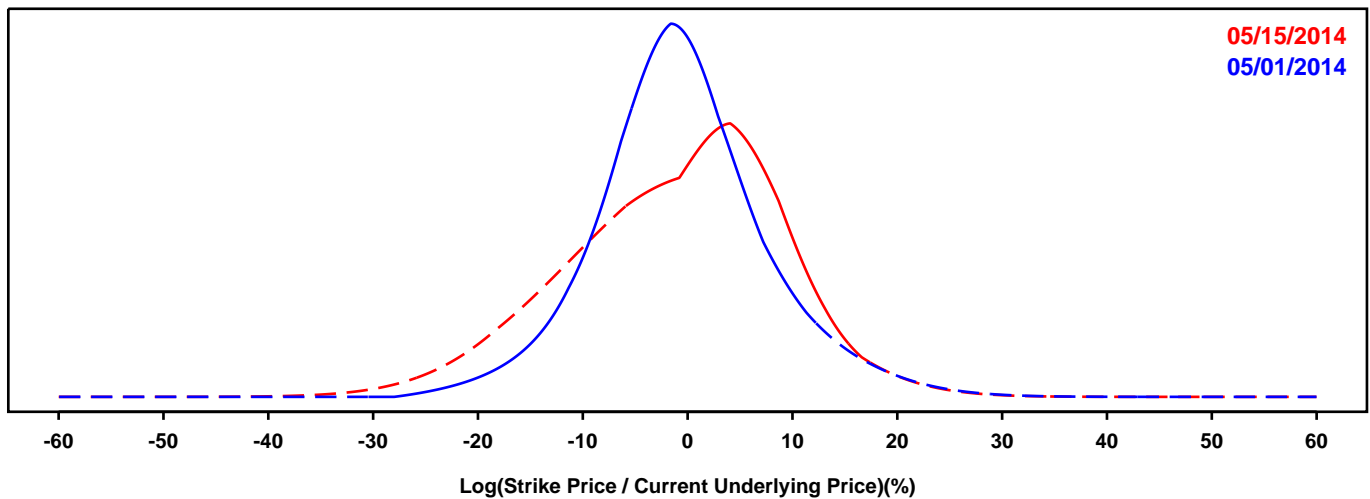
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- FIFTH THIRD

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

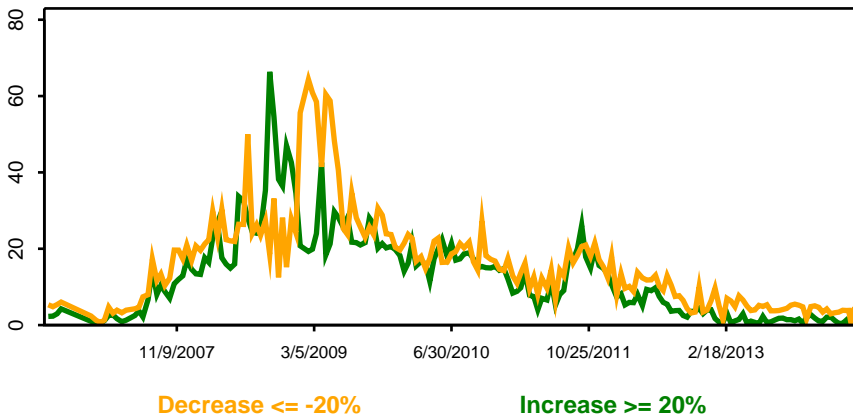
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

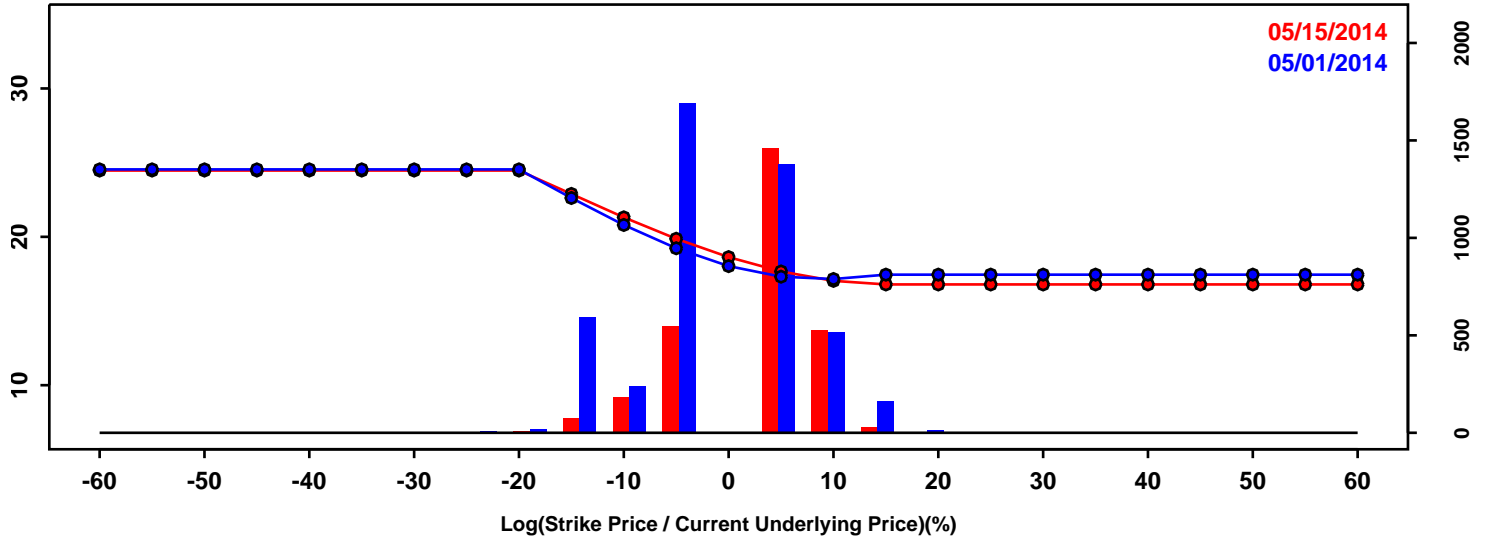


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-10.33%	-15.16%	-4.83%
50th Pct	-0.91%	-0.09%	0.83%
90th Pct	9.89%	10.94%	1.05%
Mean	-0.50%	-1.13%	-0.64%
Std Dev	8.21%	10.33%	2.12%
Skew	0.30	-0.31	-0.62
Kurtosis	0.80	0.09	-0.71

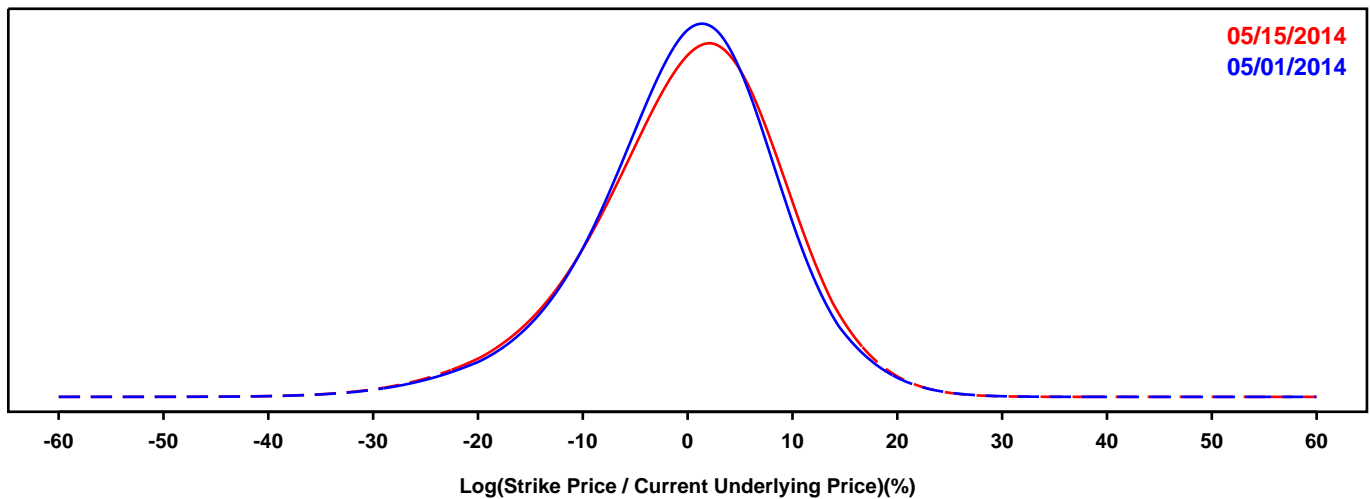
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- GOLDMAN SACHS

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

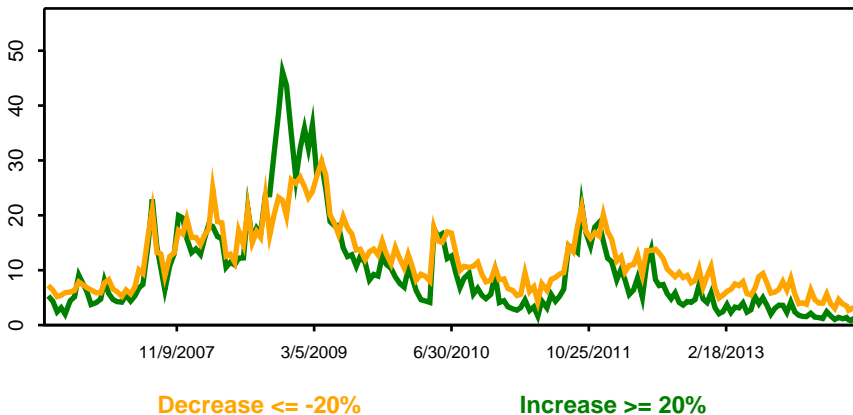
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

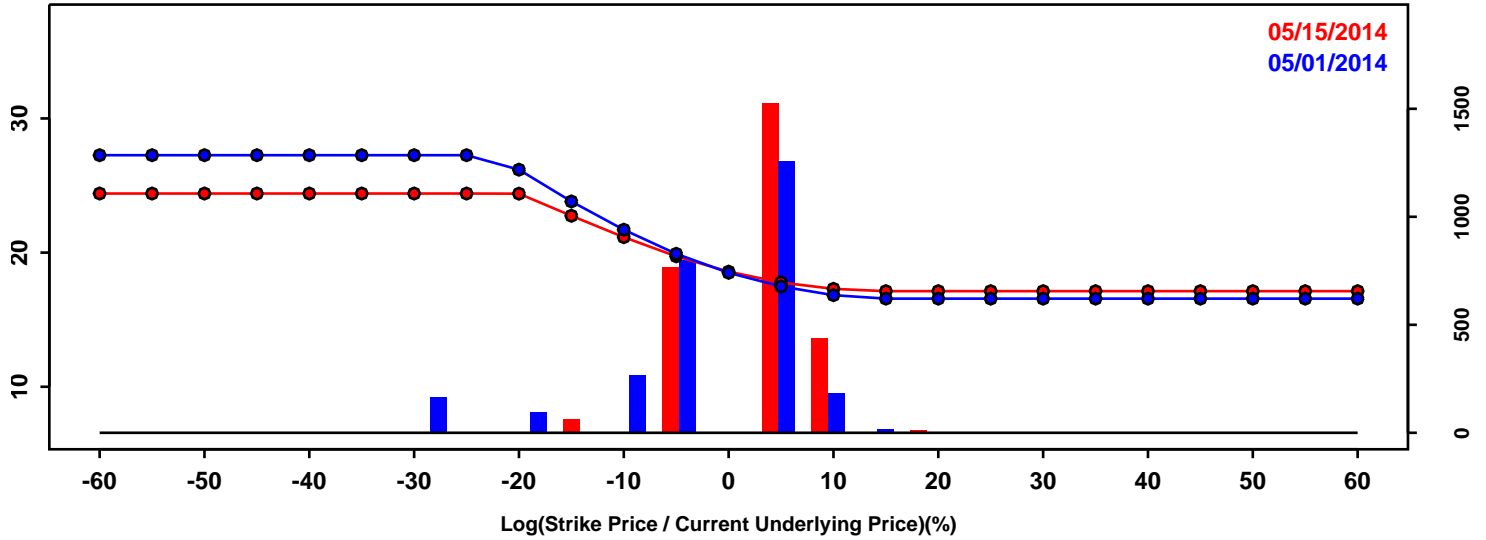


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-11.93%	-12.40%	-0.47%
50th Pct	0.34%	0.64%	0.30%
90th Pct	10.30%	10.89%	0.59%
Mean	-0.33%	-0.15%	0.18%
Std Dev	9.08%	9.38%	0.30%
Skew	-0.48	-0.50	-0.03
Kurtosis	0.87	0.67	-0.20

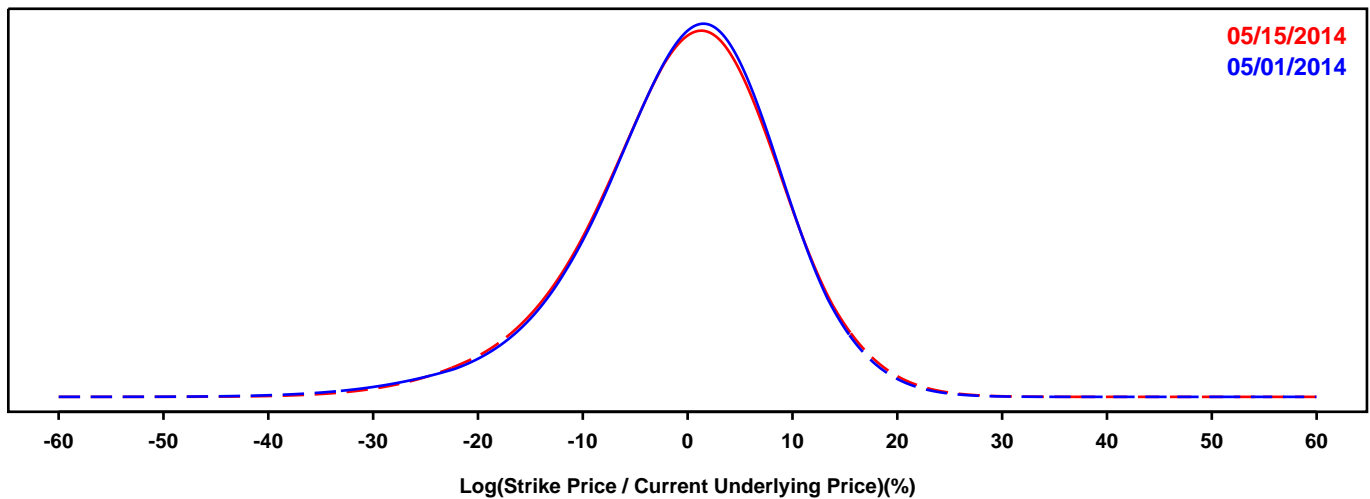
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- JP MORGAN

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

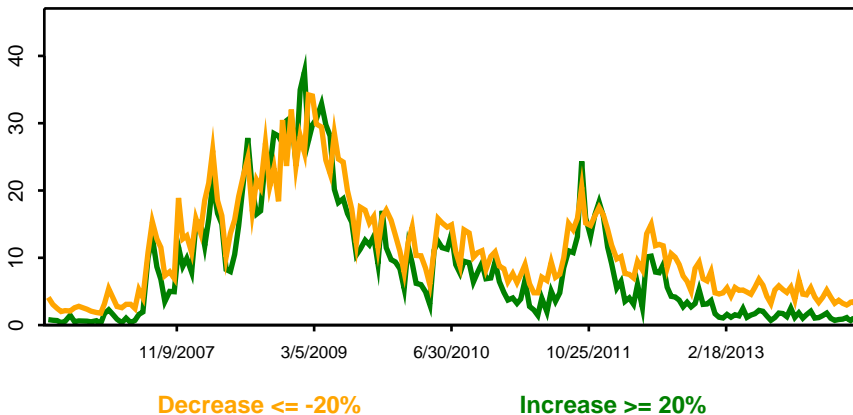
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

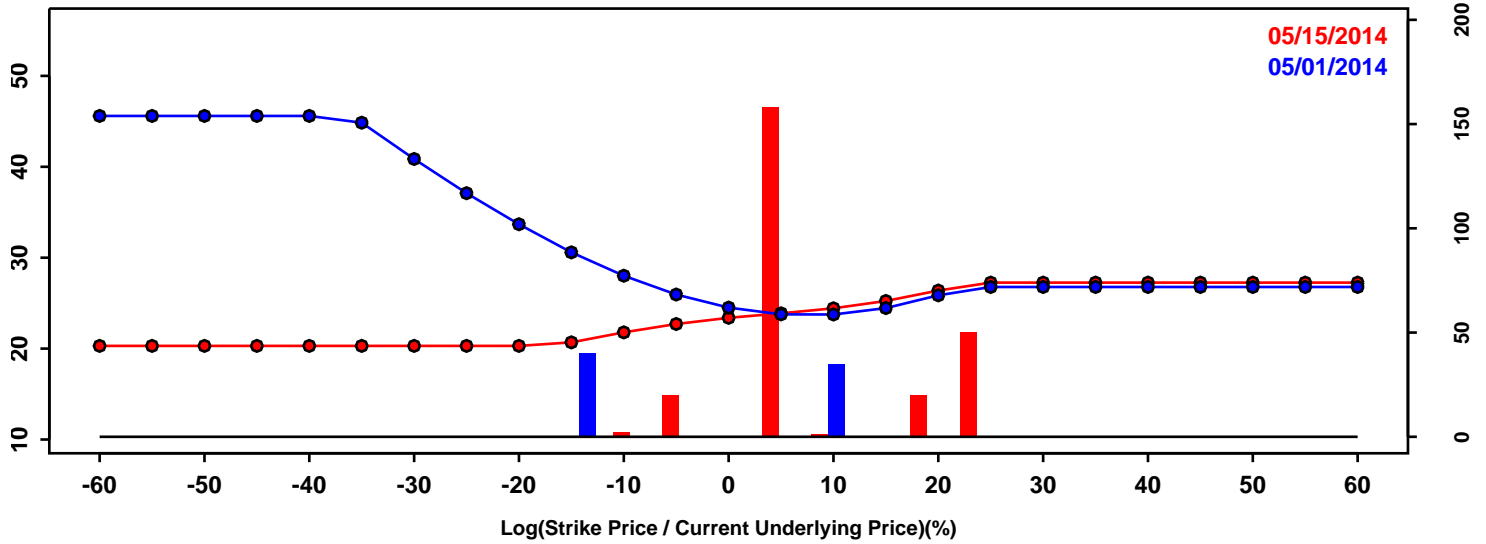


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-12.47%	-12.58%	-0.11%
50th Pct	0.24%	0.21%	-0.03%
90th Pct	10.39%	10.65%	0.26%
Mean	-0.54%	-0.47%	0.06%
Std Dev	9.39%	9.37%	-0.02%
Skew	-0.62	-0.47	0.15
Kurtosis	1.10	0.68	-0.42

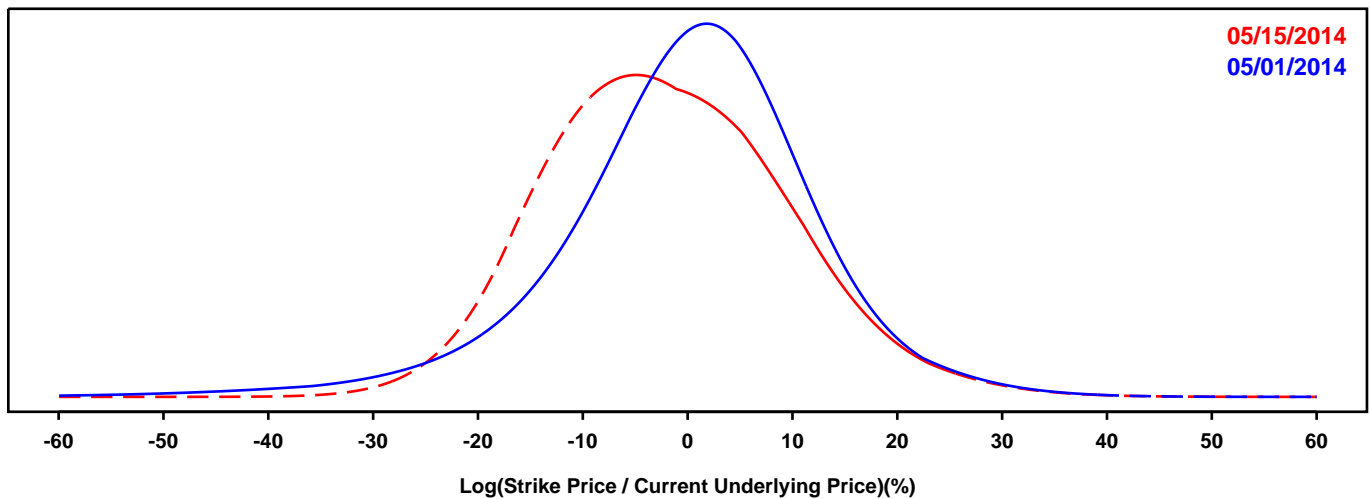
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- KEYCORP

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

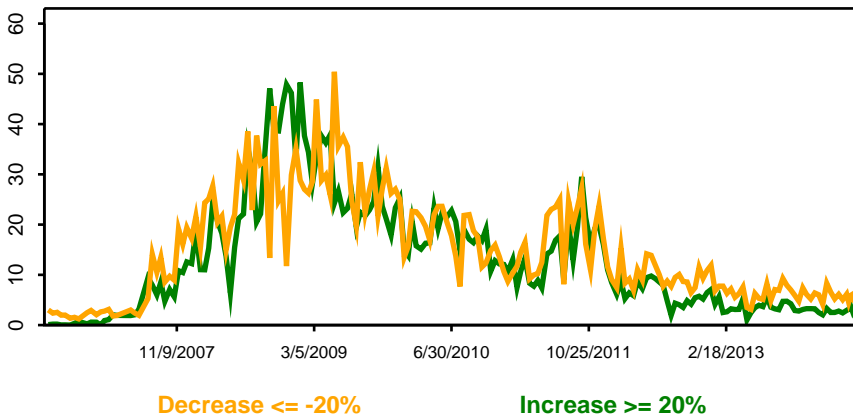
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

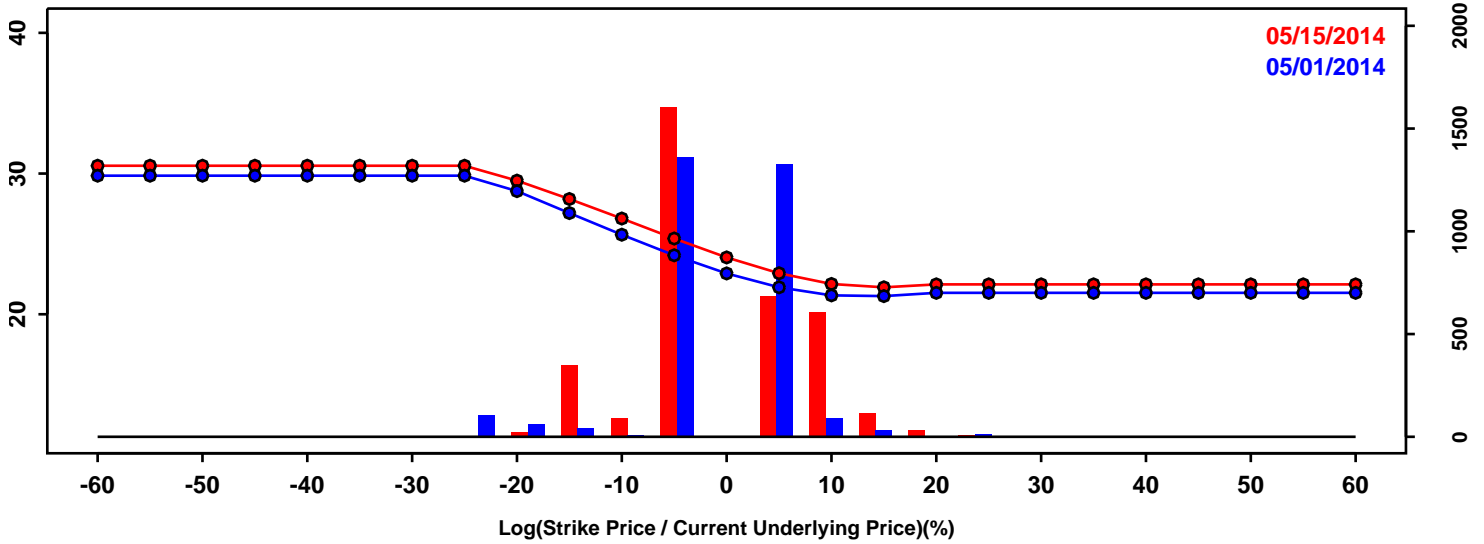


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-15.10%	-16.08%	-0.98%
50th Pct	0.72%	-2.42%	-3.14%
90th Pct	13.96%	13.06%	-0.89%
Mean	-0.14%	-1.84%	-1.70%
Std Dev	12.51%	11.50%	-1.01%
Skew	-0.70	0.28	0.98
Kurtosis	2.29	0.09	-2.20

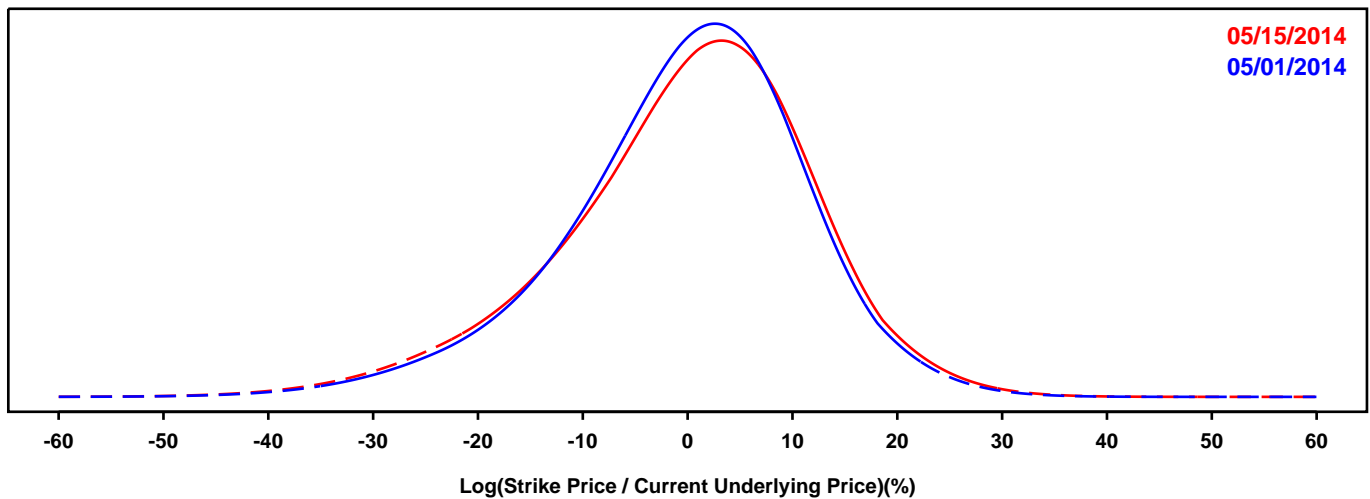
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- MORGAN STANLEY

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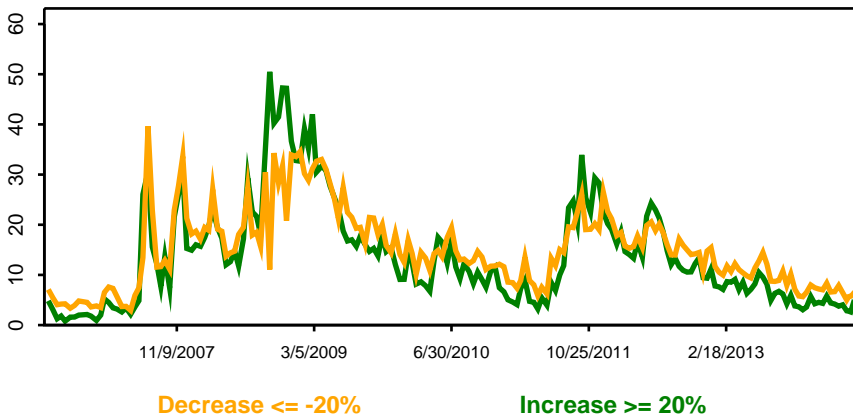
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

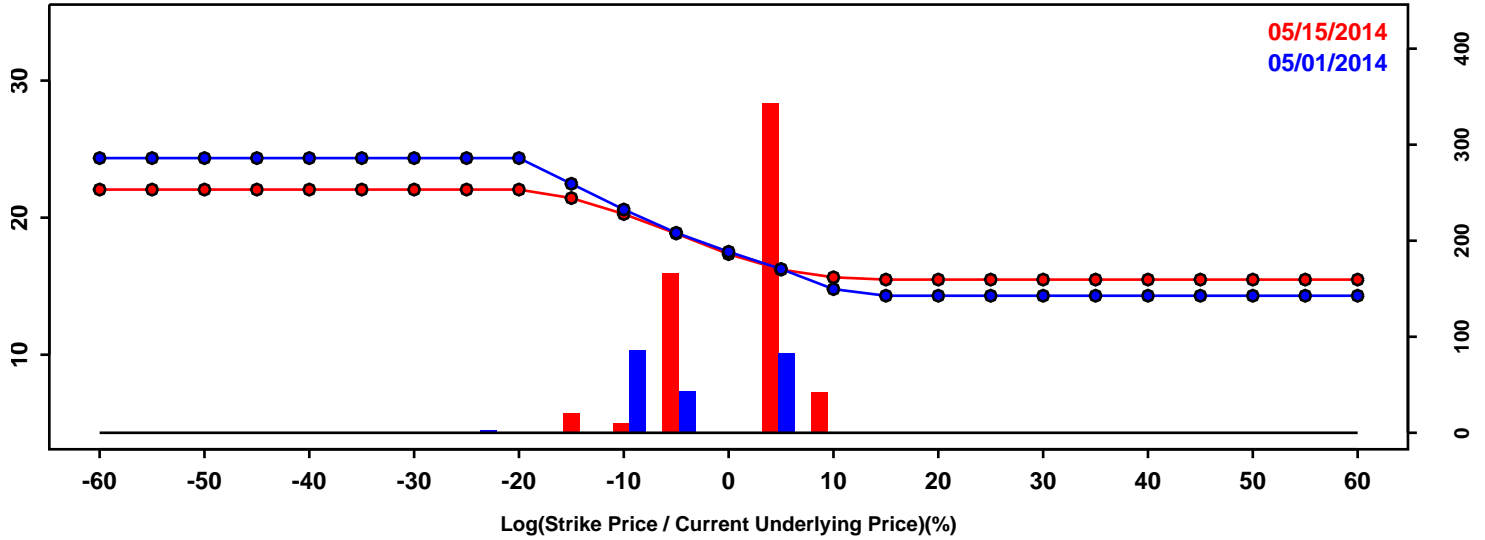


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-15.31%	-16.29%	-0.98%
50th Pct	0.77%	1.11%	0.34%
90th Pct	13.15%	13.95%	0.80%
Mean	-0.25%	-0.11%	0.14%
Std Dev	11.53%	12.13%	0.60%
Skew	-0.51	-0.53	-0.01
Kurtosis	0.74	0.63	-0.11

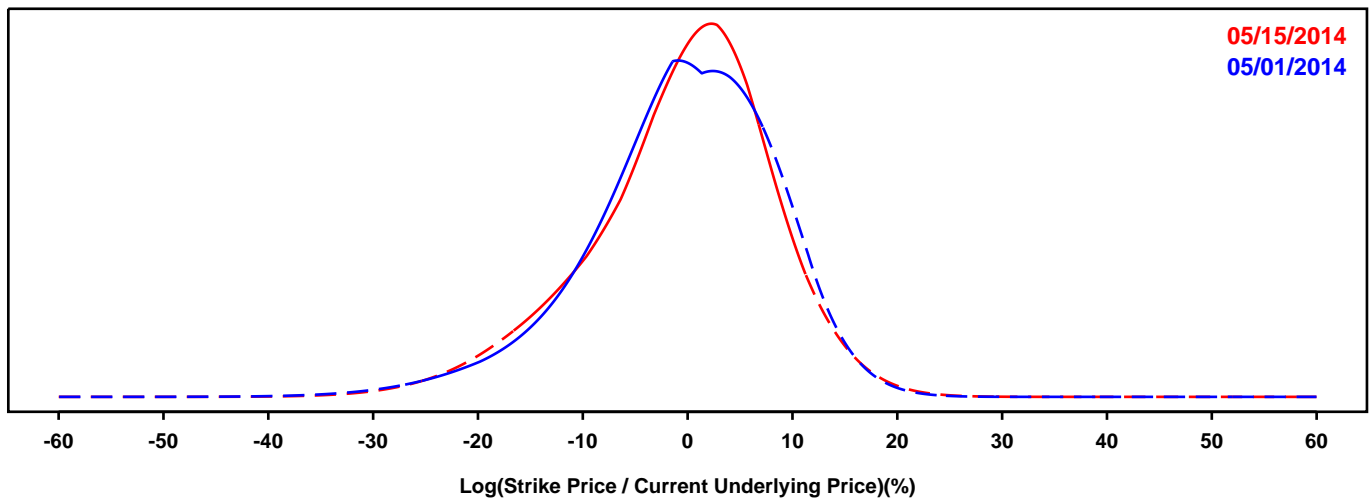
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- PNC FINANCIAL

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

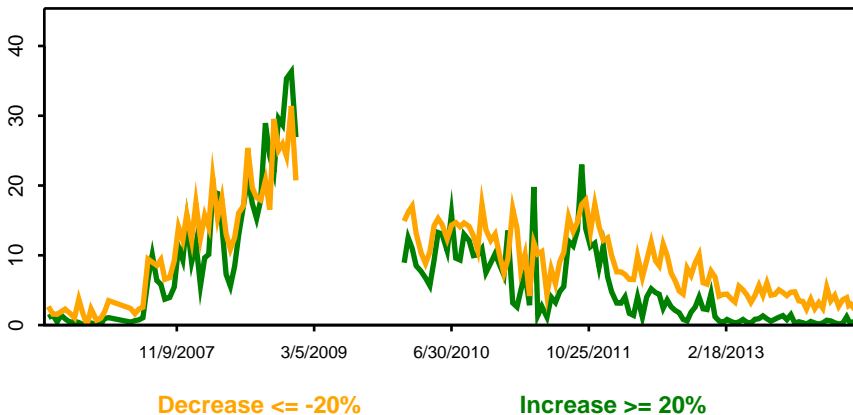
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

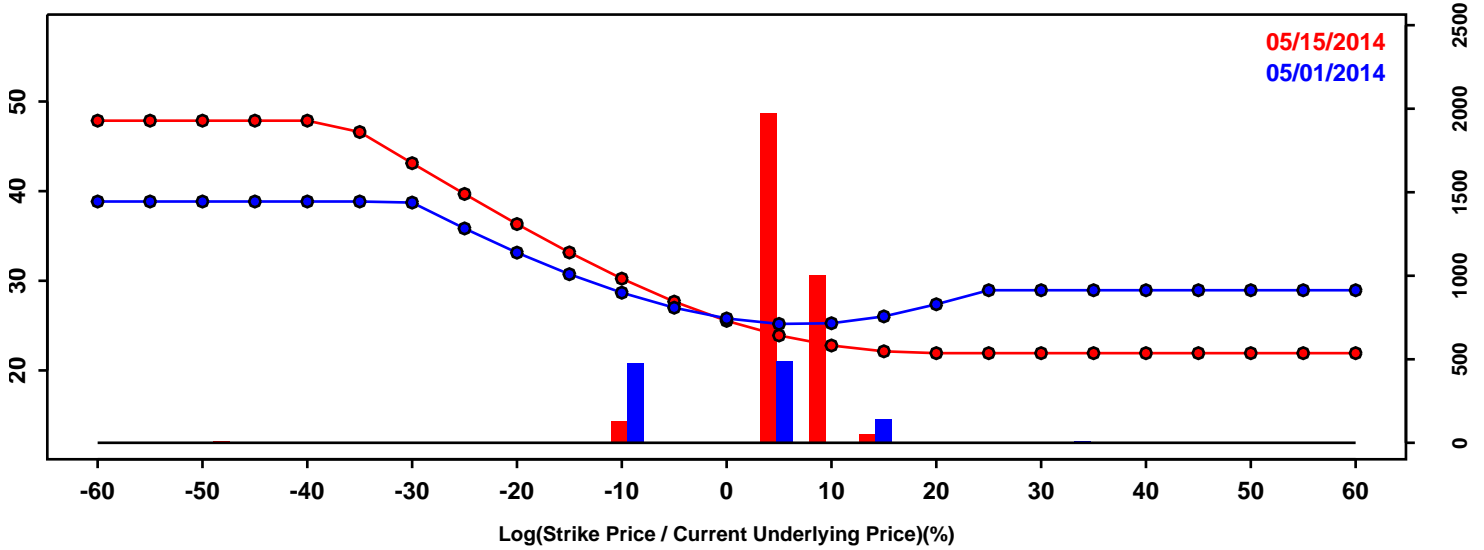


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-12.11%	-12.80%	-0.70%
50th Pct	0.25%	0.36%	0.11%
90th Pct	10.08%	9.62%	-0.46%
Mean	-0.49%	-0.65%	-0.16%
Std Dev	8.95%	8.91%	-0.05%
Skew	-0.63	-0.57	0.06
Kurtosis	0.80	0.59	-0.21

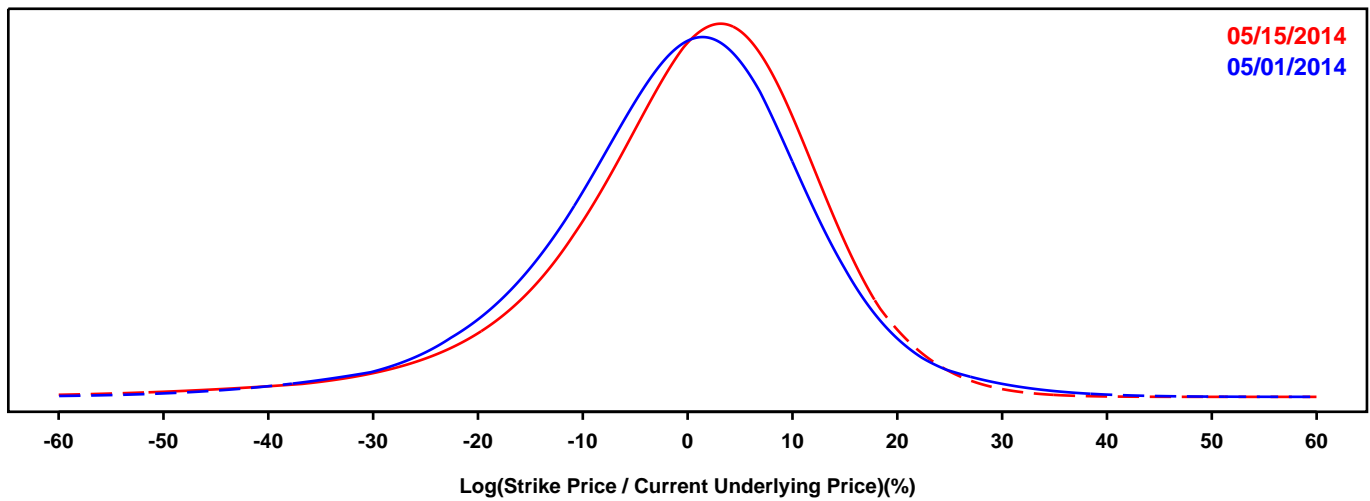
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- REGIONS FINANCIAL

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

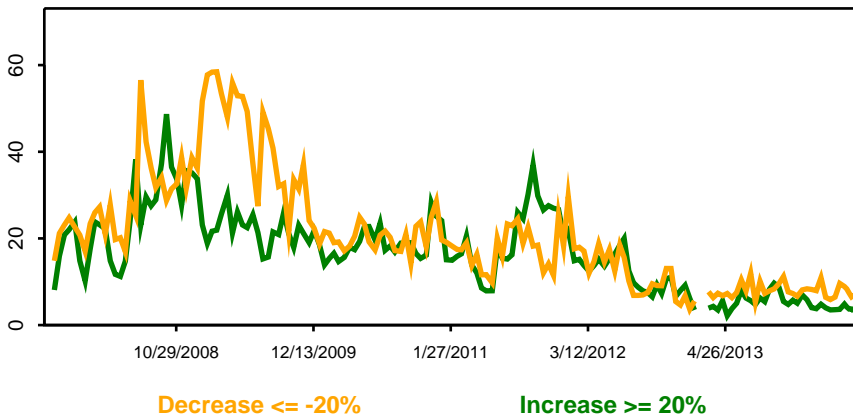
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

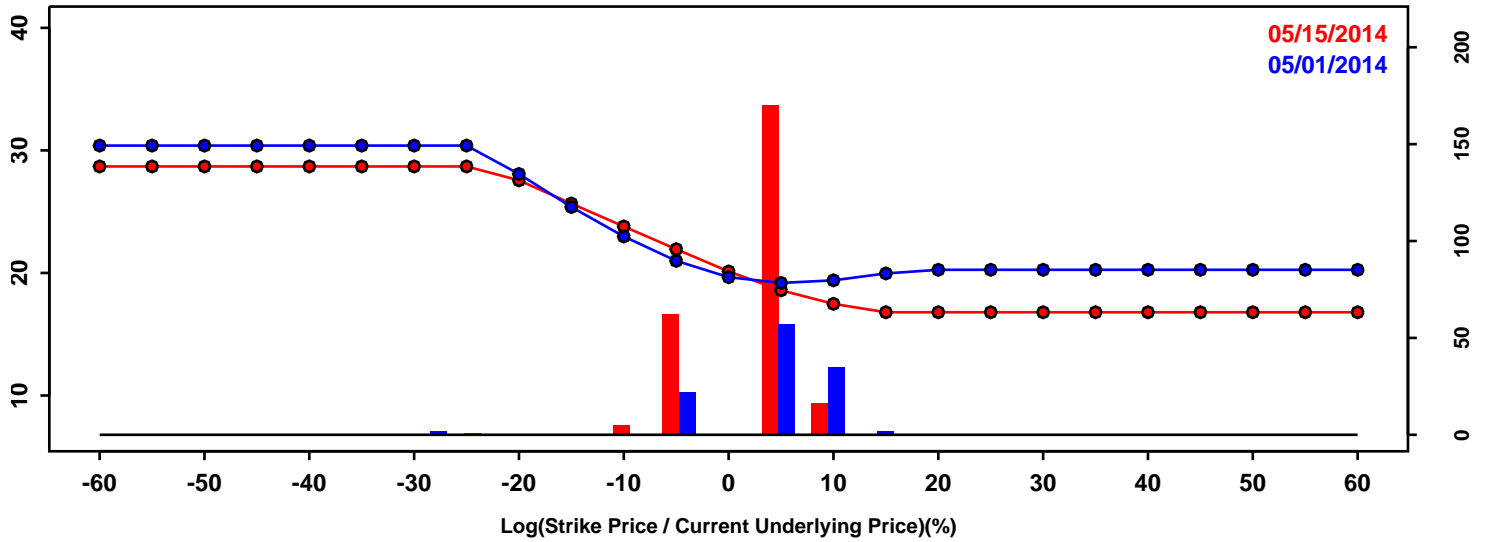


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-17.15%	-16.15%	1.00%
50th Pct	-0.04%	1.33%	1.37%
90th Pct	13.76%	14.16%	0.40%
Mean	-1.02%	-0.20%	0.82%
Std Dev	12.96%	13.07%	0.11%
Skew	-0.53	-1.04	-0.51
Kurtosis	1.46	2.72	1.27

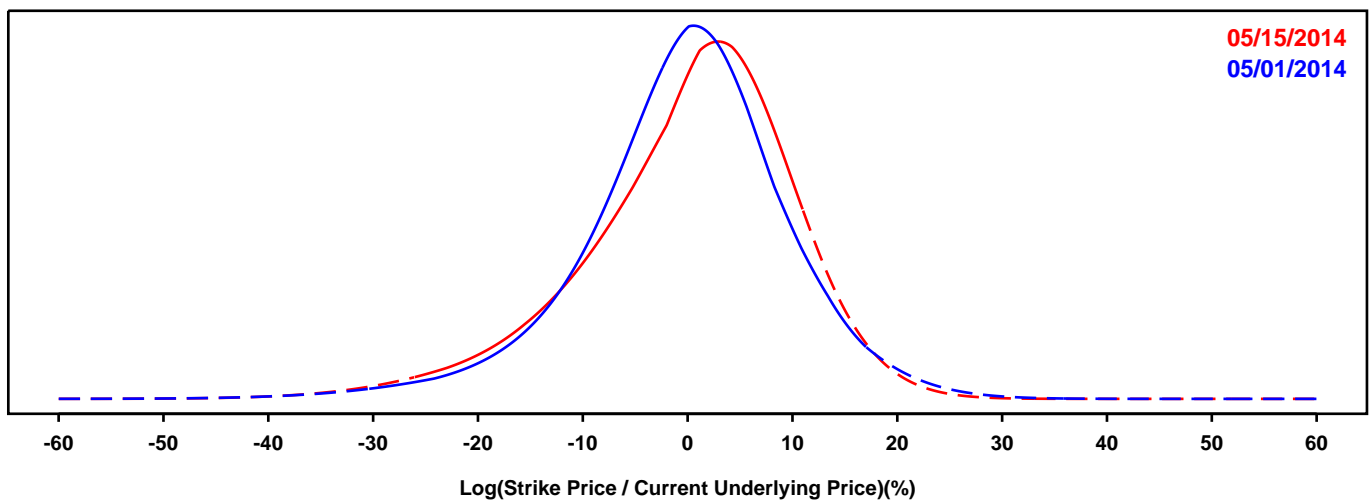
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- SUNTRUST

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

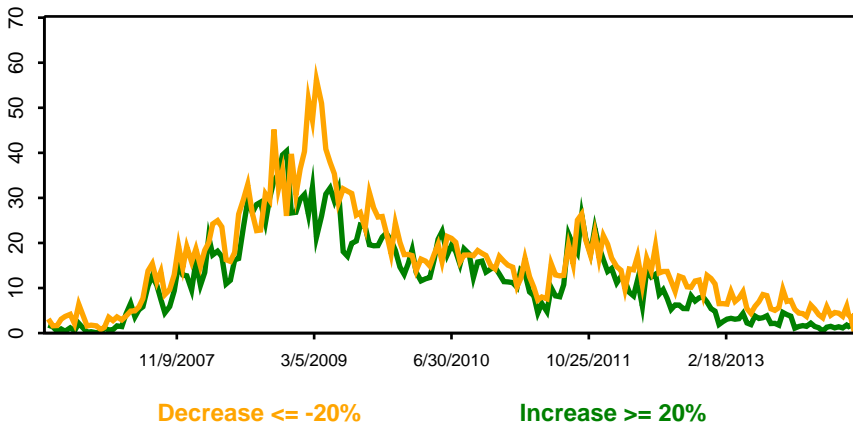
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

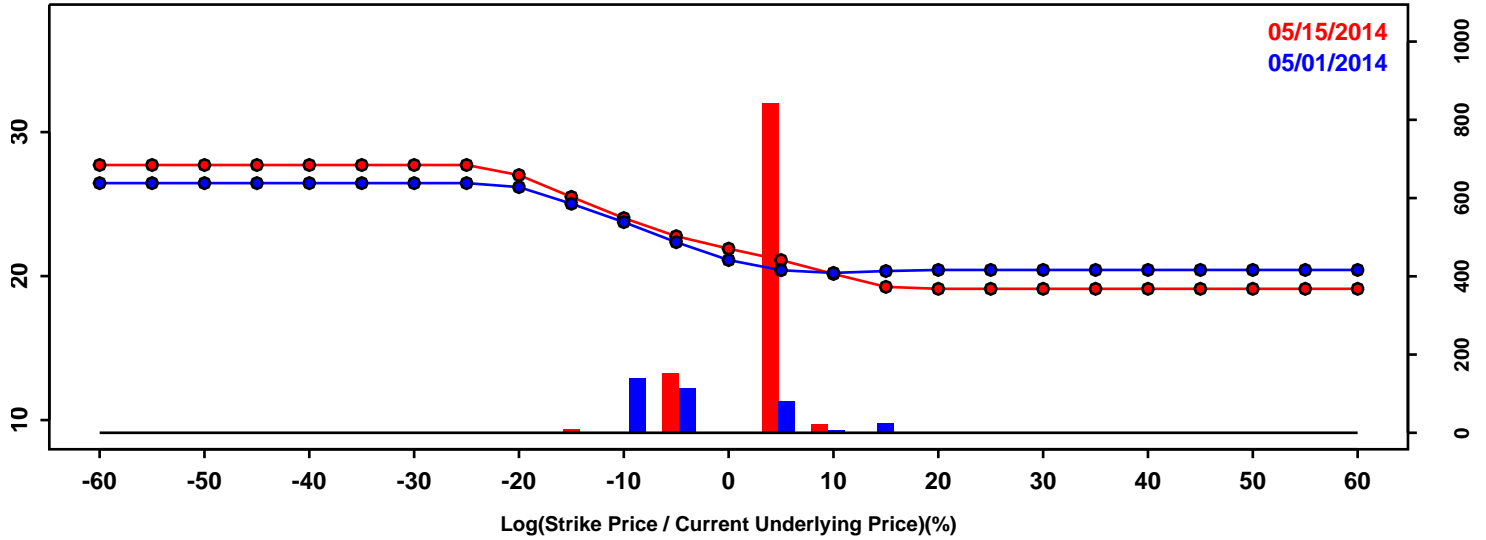


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-12.36%	-13.53%	-1.17%
50th Pct	0.29%	1.32%	1.03%
90th Pct	11.35%	11.62%	0.27%
Mean	-0.25%	0.03%	0.27%
Std Dev	9.90%	10.22%	0.32%
Skew	-0.52	-0.74	-0.22
Kurtosis	1.47	1.06	-0.41

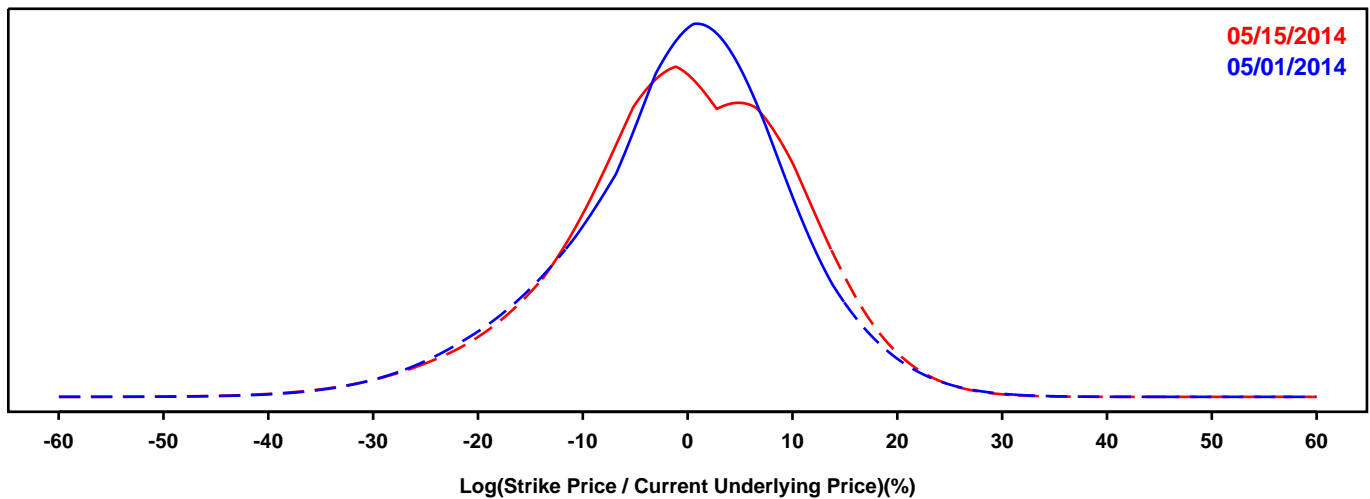
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- STATE STREET

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

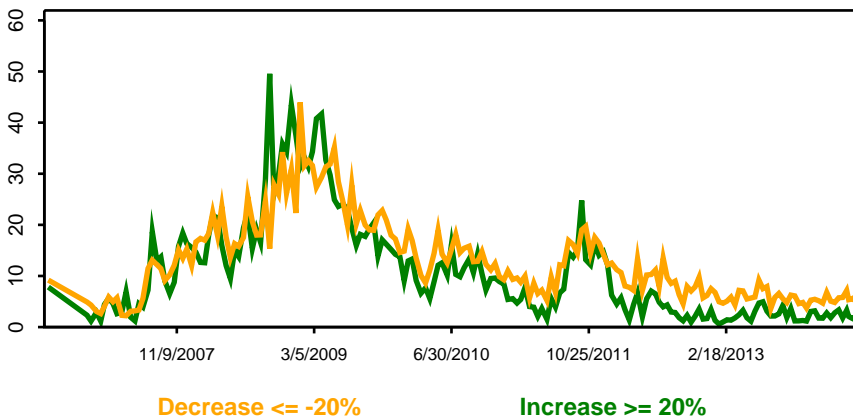
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

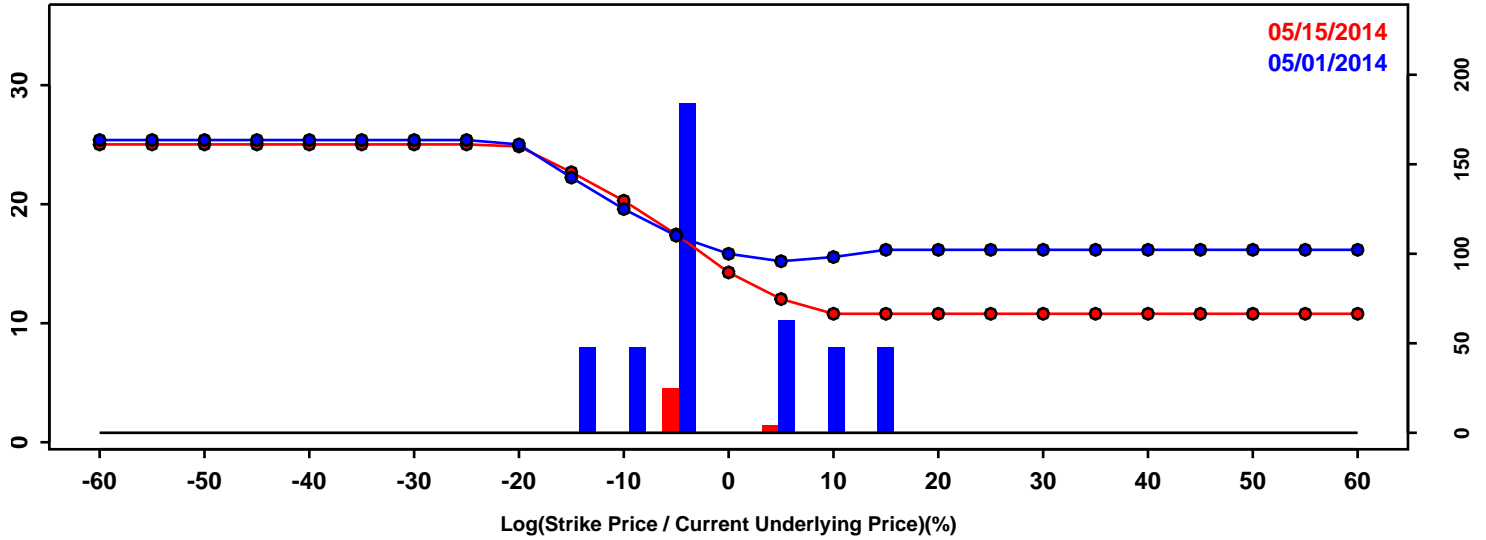


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-15.32%	-14.90%	0.43%
50th Pct	0.04%	-0.04%	-0.09%
90th Pct	11.81%	12.84%	1.03%
Mean	-0.88%	-0.55%	0.33%
Std Dev	10.82%	11.07%	0.26%
Skew	-0.44	-0.44	0.01
Kurtosis	0.60	0.48	-0.13

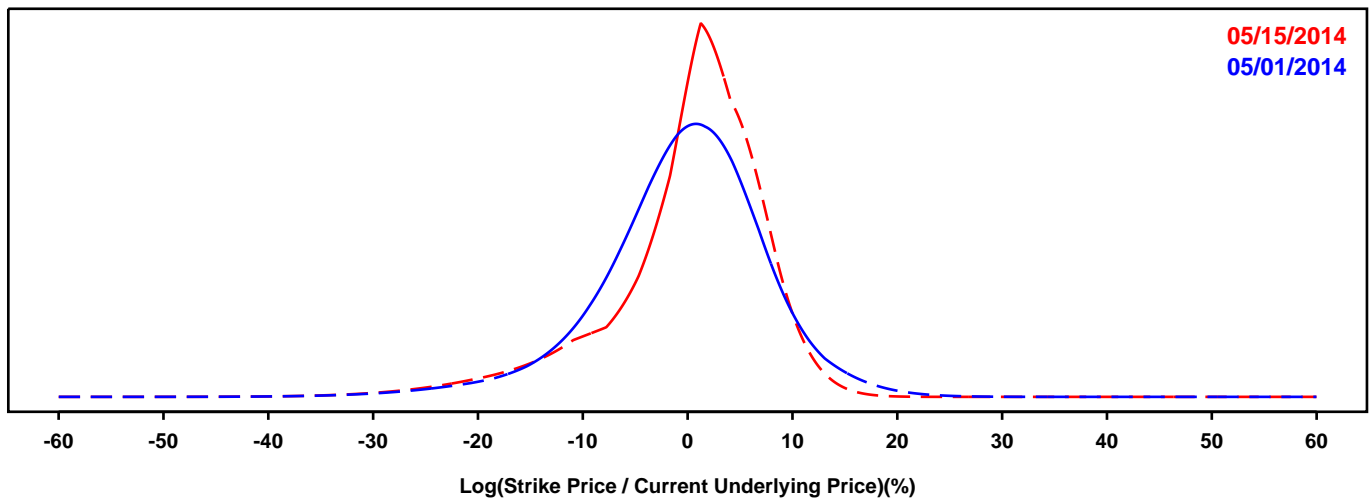
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- US BANCORP

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

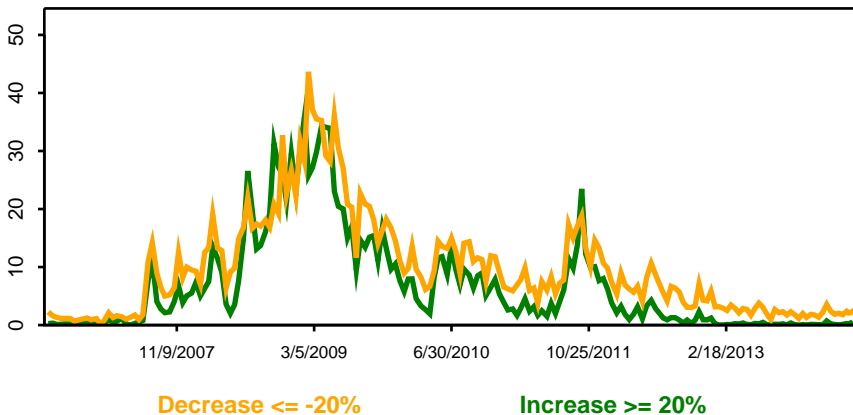
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

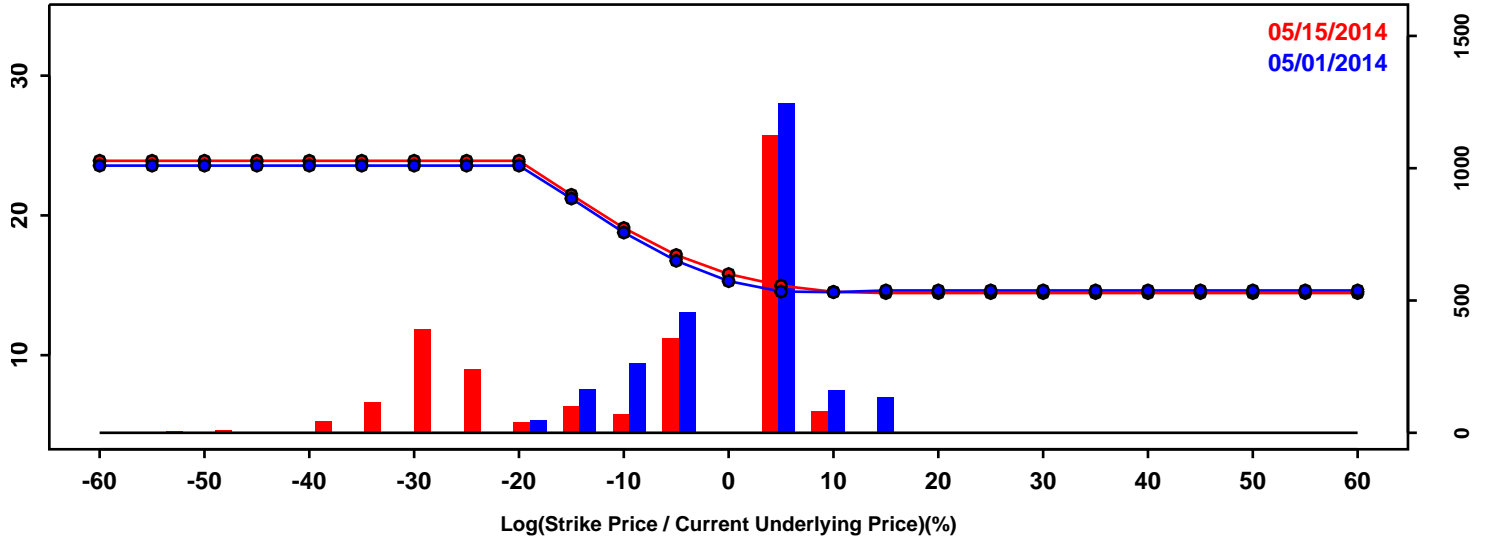


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-10.17%	-10.24%	-0.07%
50th Pct	0.15%	1.32%	1.18%
90th Pct	8.63%	7.80%	-0.83%
Mean	-0.44%	-0.02%	0.42%
Std Dev	7.97%	7.61%	-0.37%
Skew	-0.64	-1.30	-0.66
Kurtosis	1.70	2.67	0.97

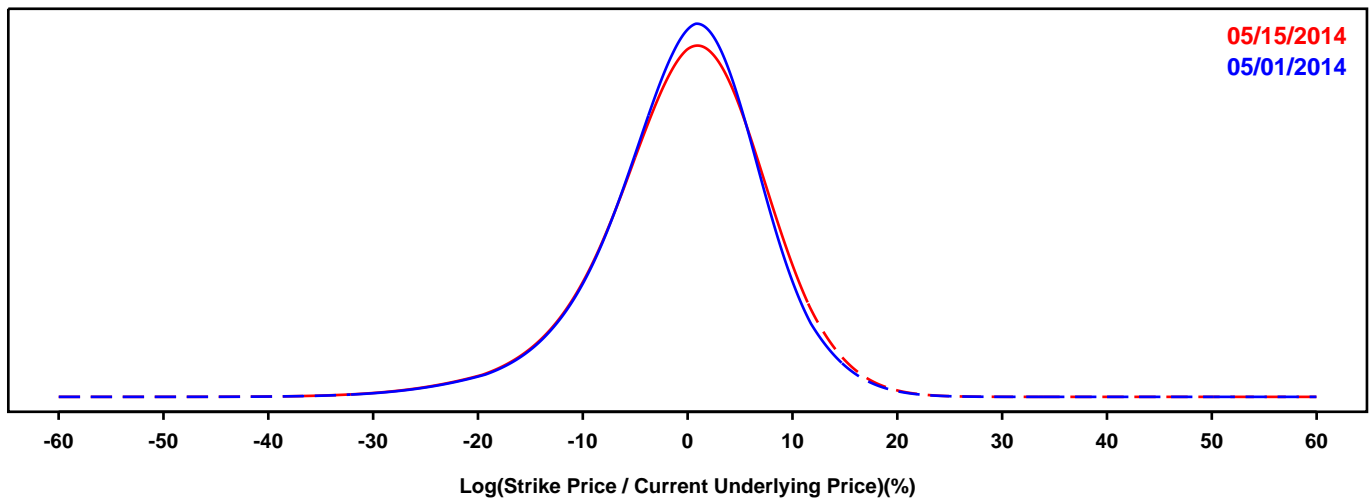
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- WELLS FARGO

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

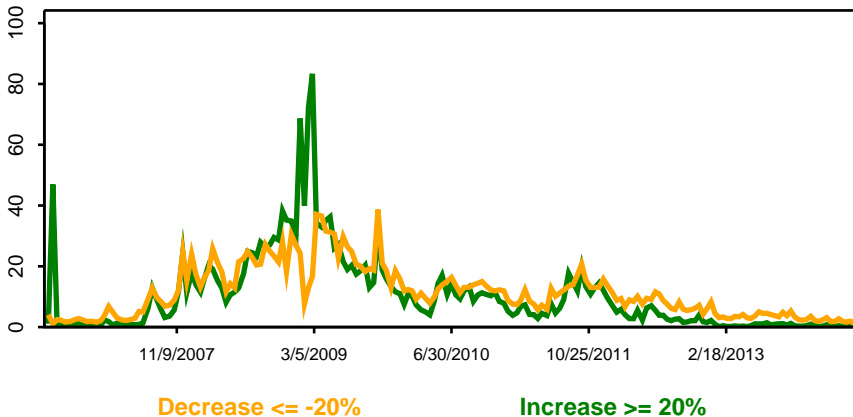
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

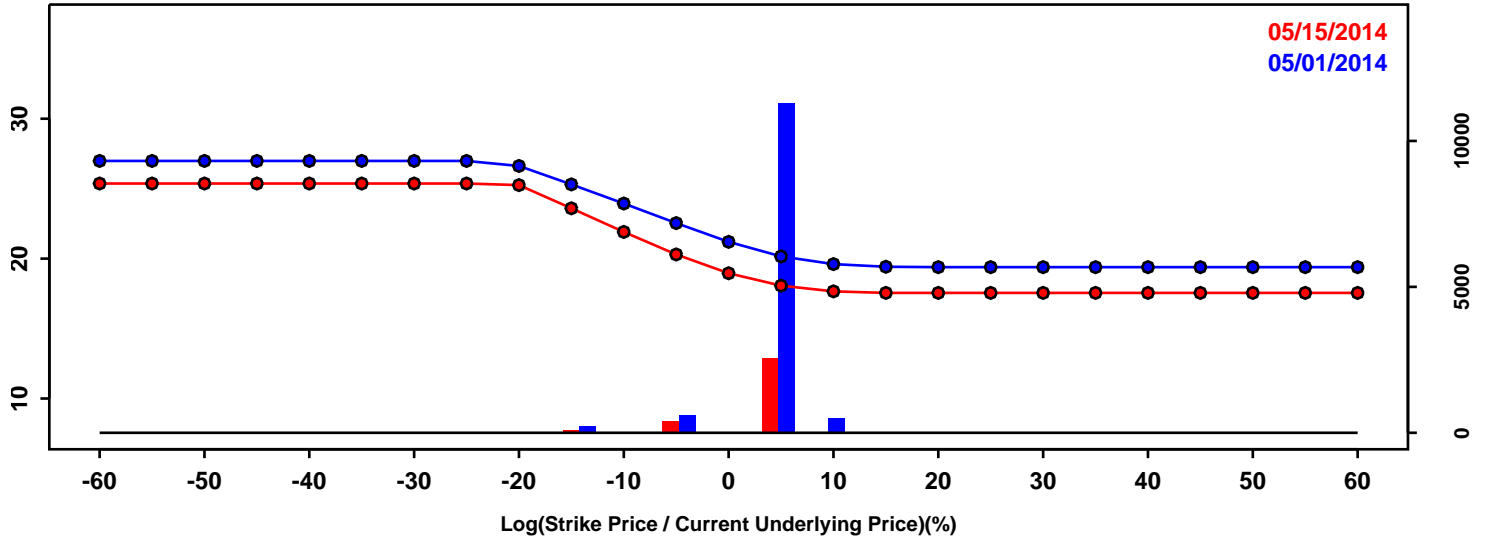


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-10.23%	-10.42%	-0.19%
50th Pct	0.10%	0.21%	0.12%
90th Pct	8.50%	9.04%	0.54%
Mean	-0.49%	-0.34%	0.16%
Std Dev	7.77%	8.01%	0.24%
Skew	-0.61	-0.59	0.02
Kurtosis	1.32	1.17	-0.15

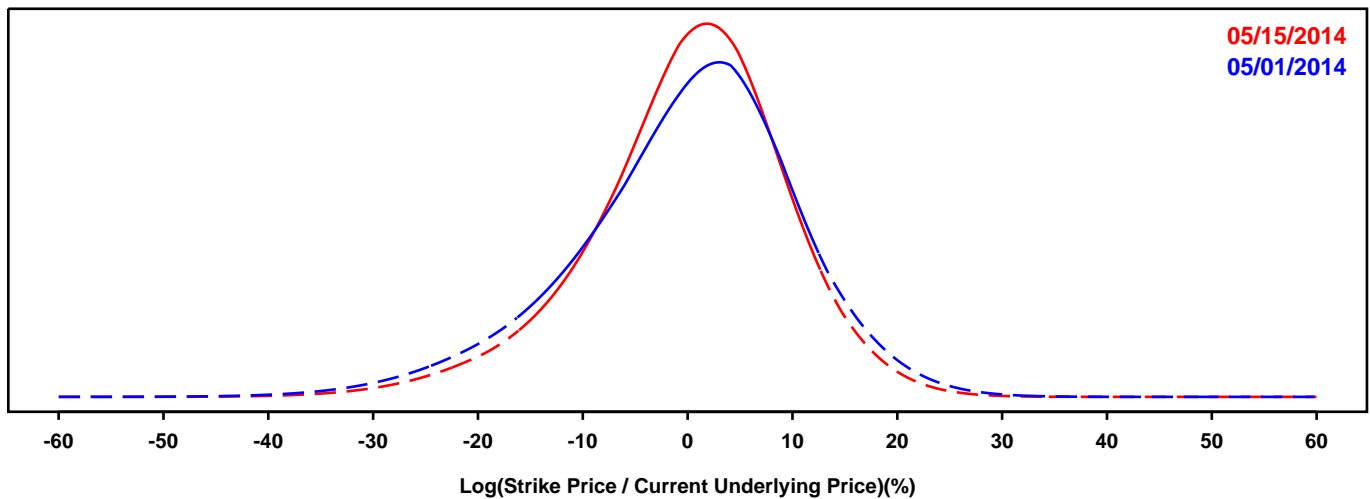
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- AIG

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

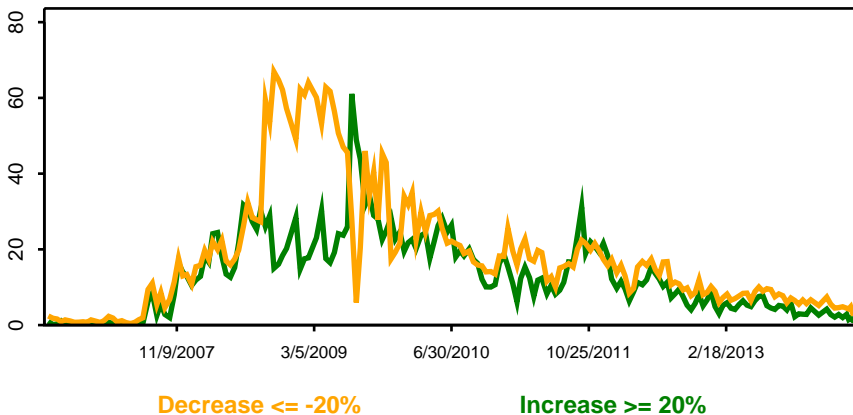
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

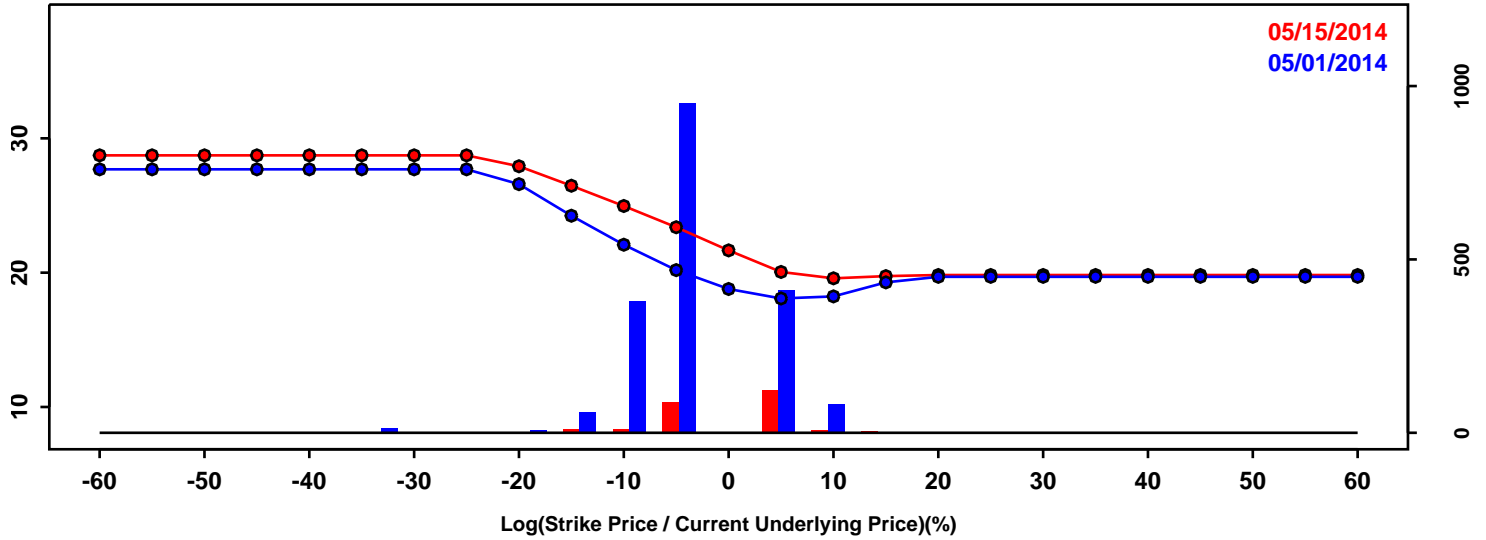


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-14.43%	-12.40%	2.03%
50th Pct	0.86%	0.74%	-0.12%
90th Pct	12.34%	11.18%	-1.15%
Mean	-0.20%	-0.02%	0.18%
Std Dev	10.73%	9.54%	-1.19%
Skew	-0.51	-0.52	-0.01
Kurtosis	0.63	0.83	0.20

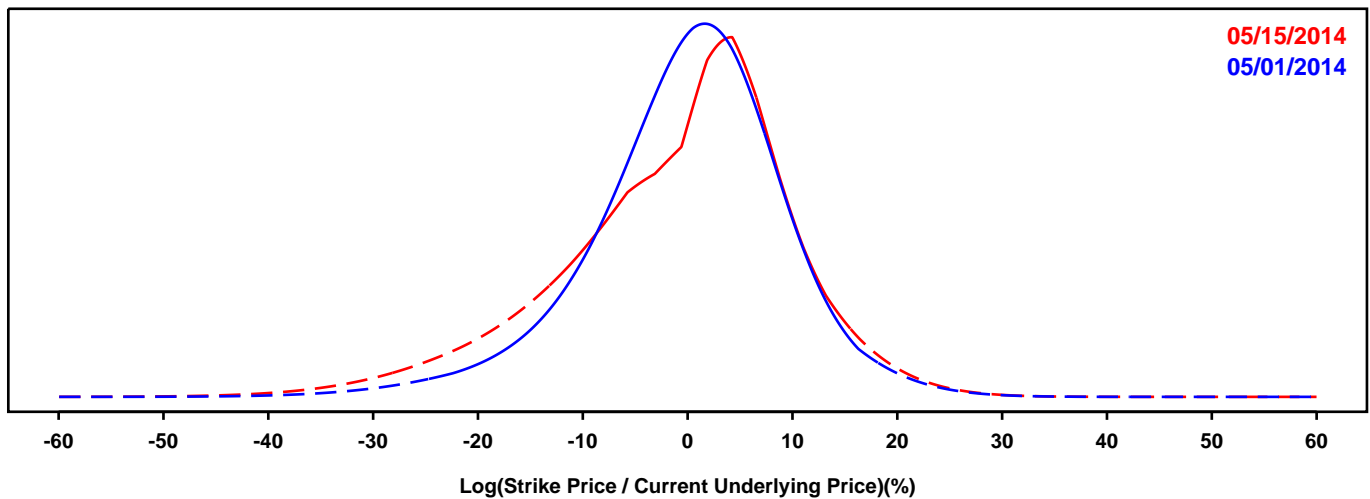
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- HARTFORD FINANCIAL

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

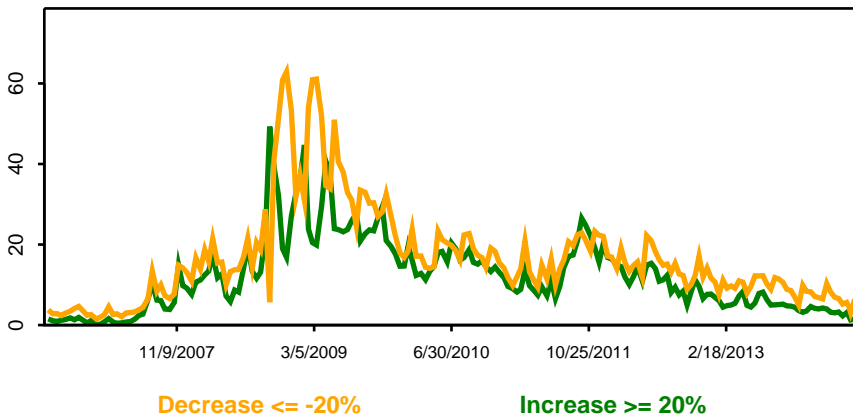
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

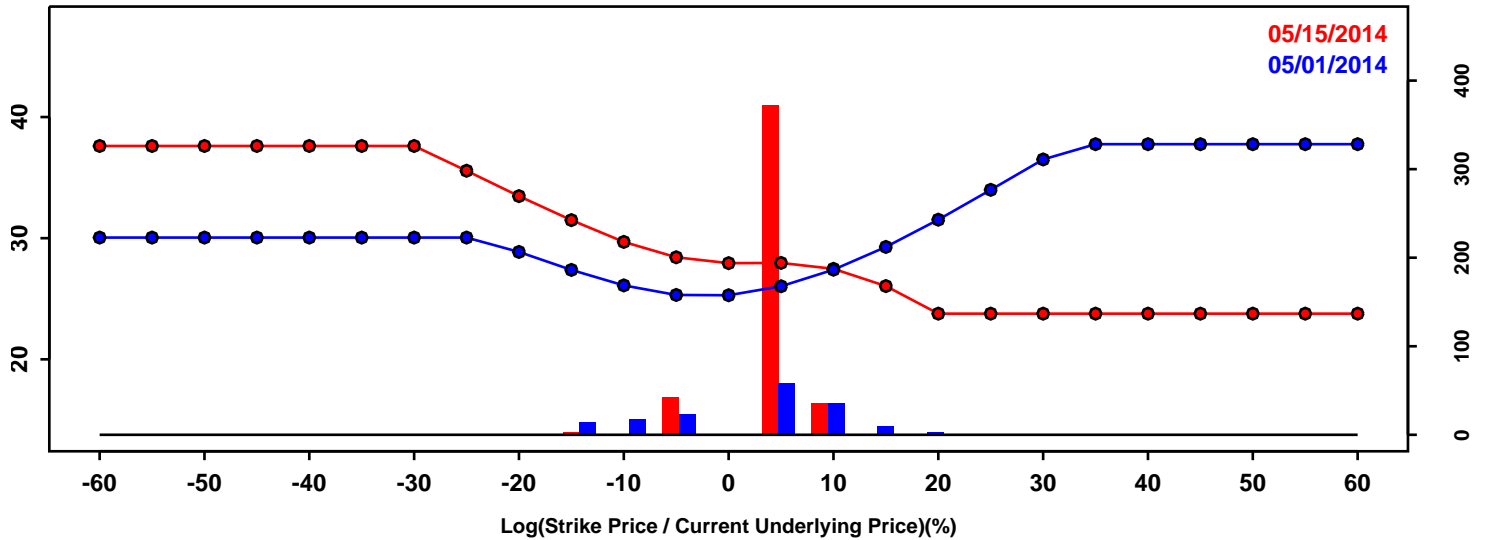


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-11.79%	-16.18%	-4.39%
50th Pct	0.66%	0.76%	0.10%
90th Pct	10.73%	11.29%	0.56%
Mean	-0.02%	-1.06%	-1.04%
Std Dev	9.39%	11.15%	1.77%
Skew	-0.53	-0.65	-0.13
Kurtosis	1.31	0.79	-0.52

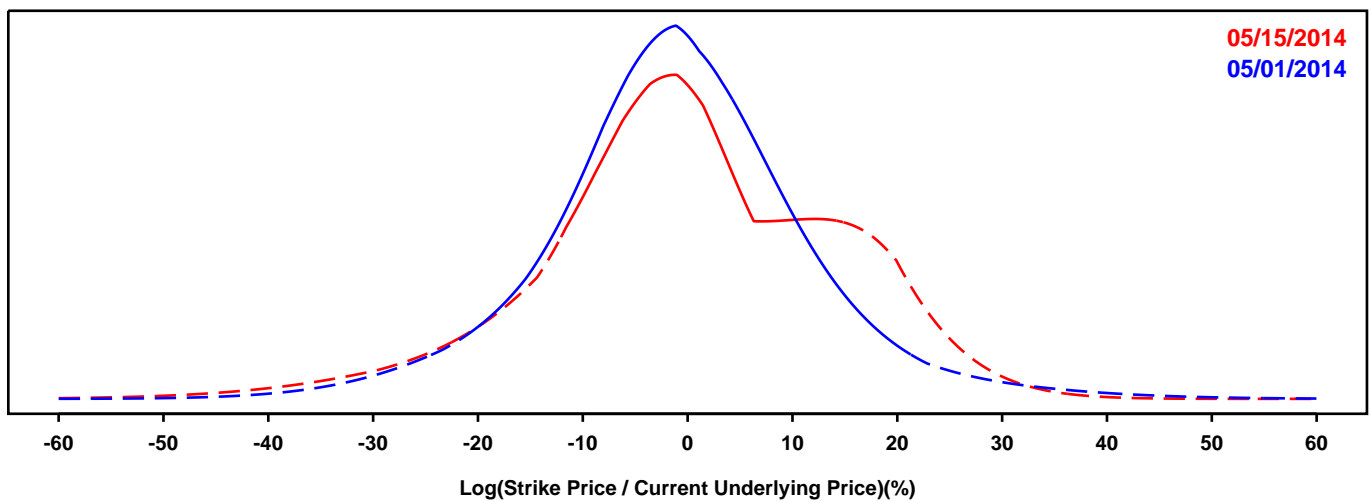
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- LINCOLN NATIONAL

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

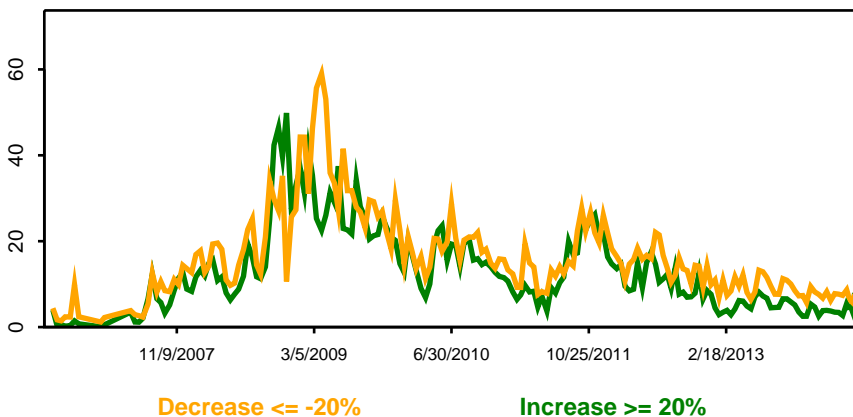
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

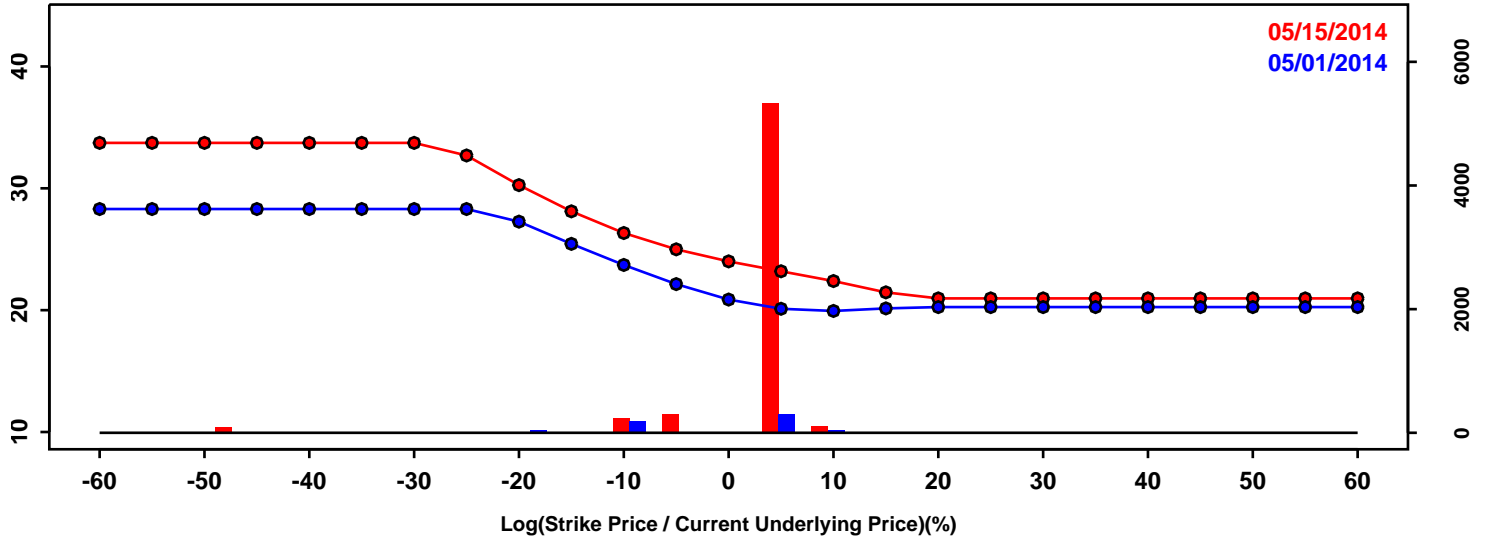


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-15.98%	-17.27%	-1.29%
50th Pct	-1.11%	-0.16%	0.95%
90th Pct	13.91%	18.67%	4.76%
Mean	-0.92%	0.23%	1.16%
Std Dev	12.60%	14.31%	1.71%
Skew	0.15	-0.35	-0.50
Kurtosis	1.41	0.54	-0.87

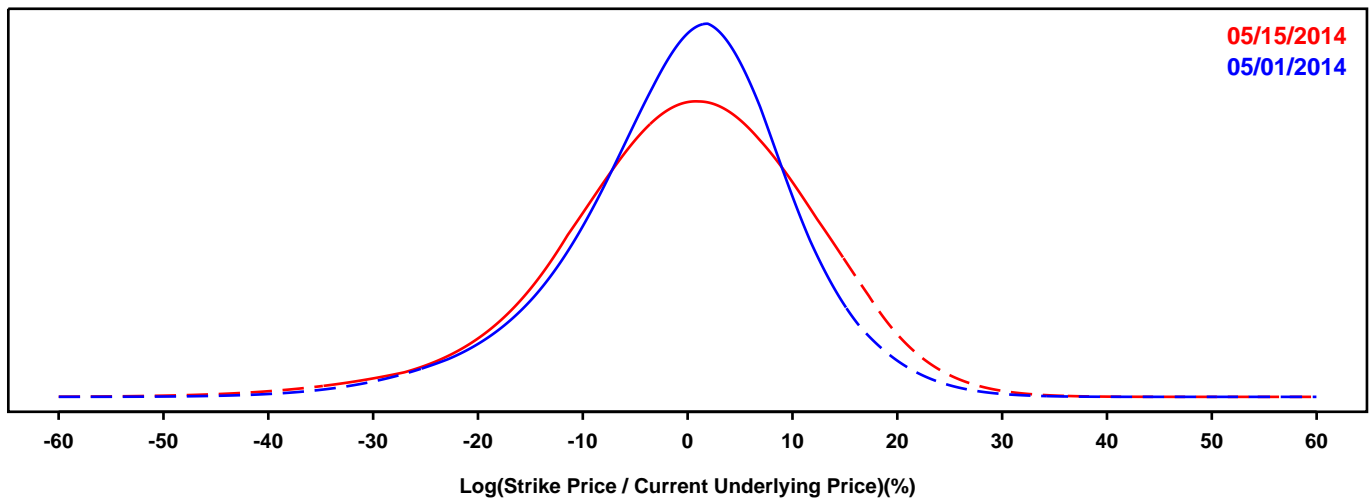
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- METLIFE

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

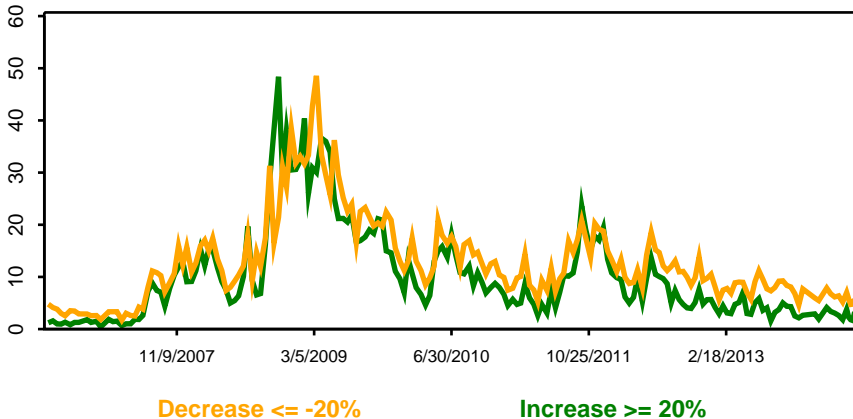
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

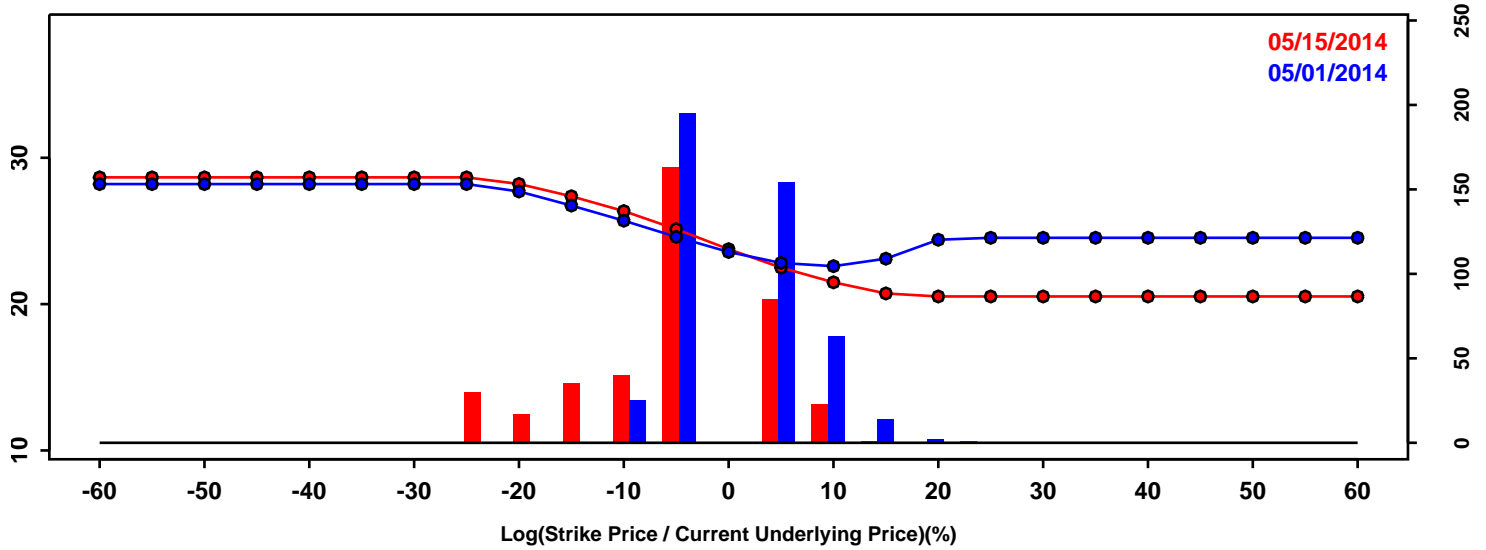


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-14.16%	-15.39%	-1.23%
50th Pct	0.24%	0.37%	0.13%
90th Pct	11.73%	14.47%	2.73%
Mean	-0.59%	-0.25%	0.34%
Std Dev	10.56%	12.07%	1.51%
Skew	-0.50	-0.47	0.02
Kurtosis	0.90	0.76	-0.14

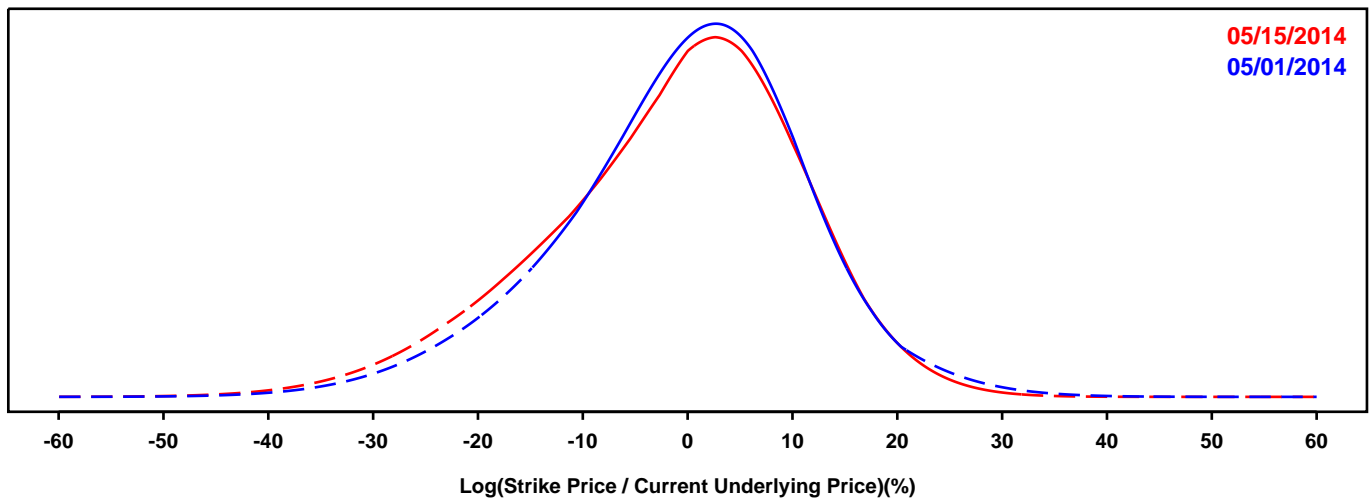
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- PRUDENTIAL

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

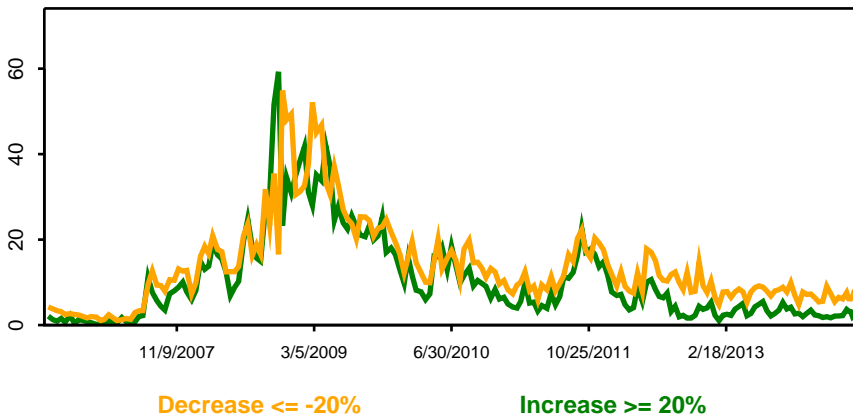
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

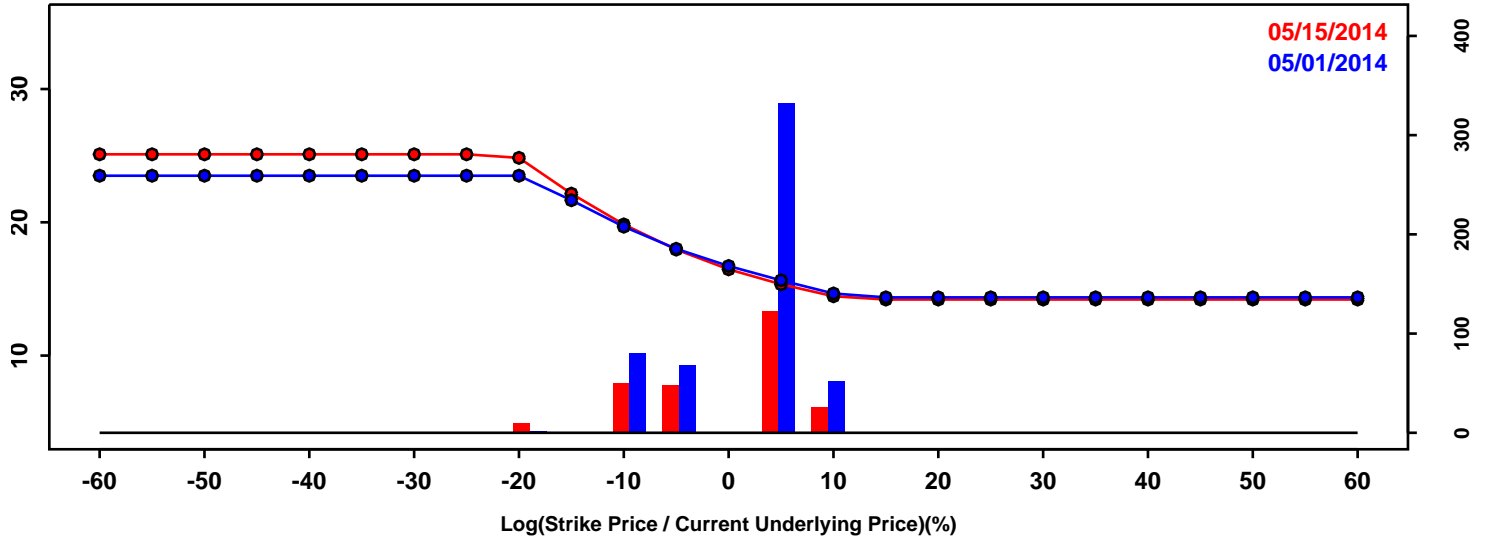


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-16.05%	-18.27%	-2.22%
50th Pct	0.60%	0.04%	-0.56%
90th Pct	13.41%	13.03%	-0.38%
Mean	-0.35%	-1.40%	-1.05%
Std Dev	11.82%	12.29%	0.47%
Skew	-0.36	-0.50	-0.14
Kurtosis	0.52	0.29	-0.23

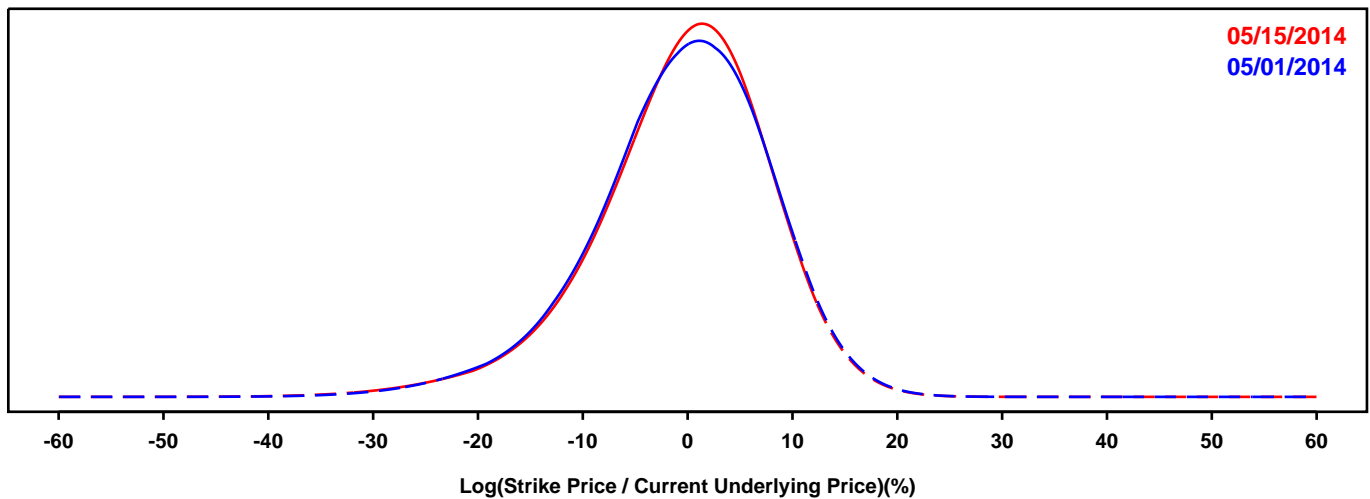
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- AFLAC

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

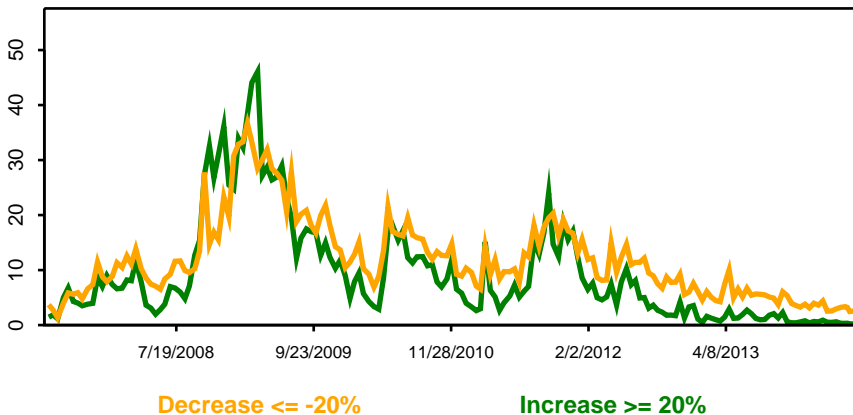
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

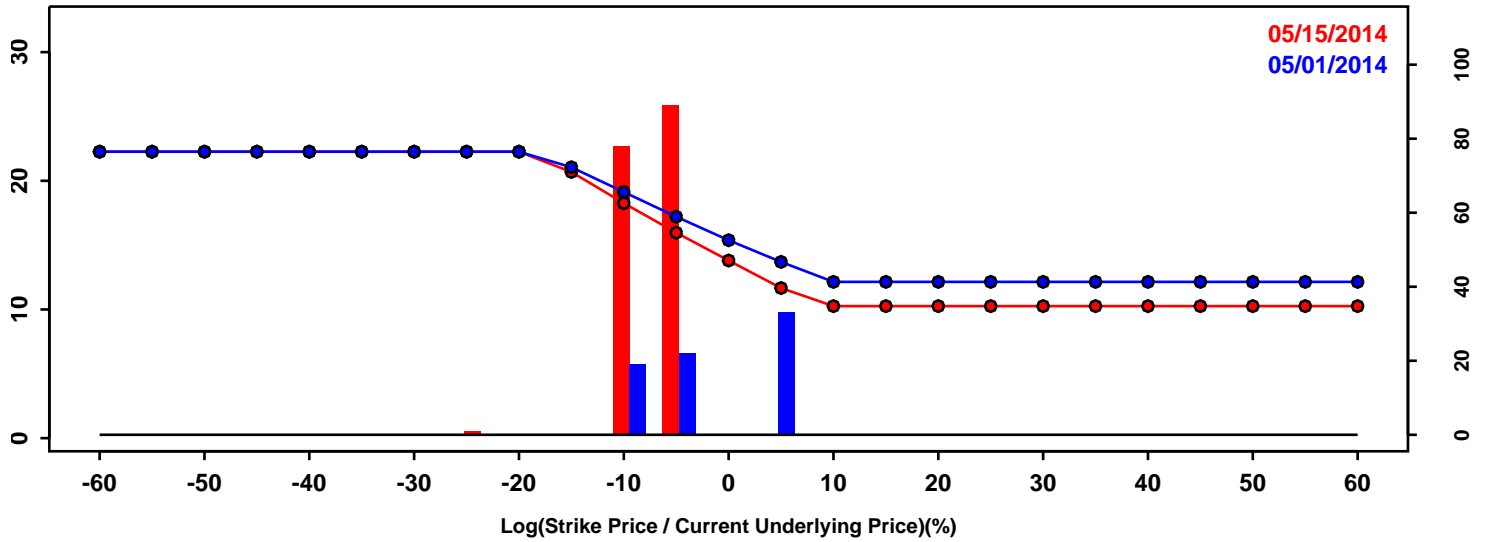


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-11.49%	-11.34%	0.15%
50th Pct	0.08%	0.22%	0.14%
90th Pct	9.48%	9.30%	-0.18%
Mean	-0.60%	-0.55%	0.05%
Std Dev	8.50%	8.47%	-0.03%
Skew	-0.57	-0.67	-0.10
Kurtosis	0.83	1.16	0.33

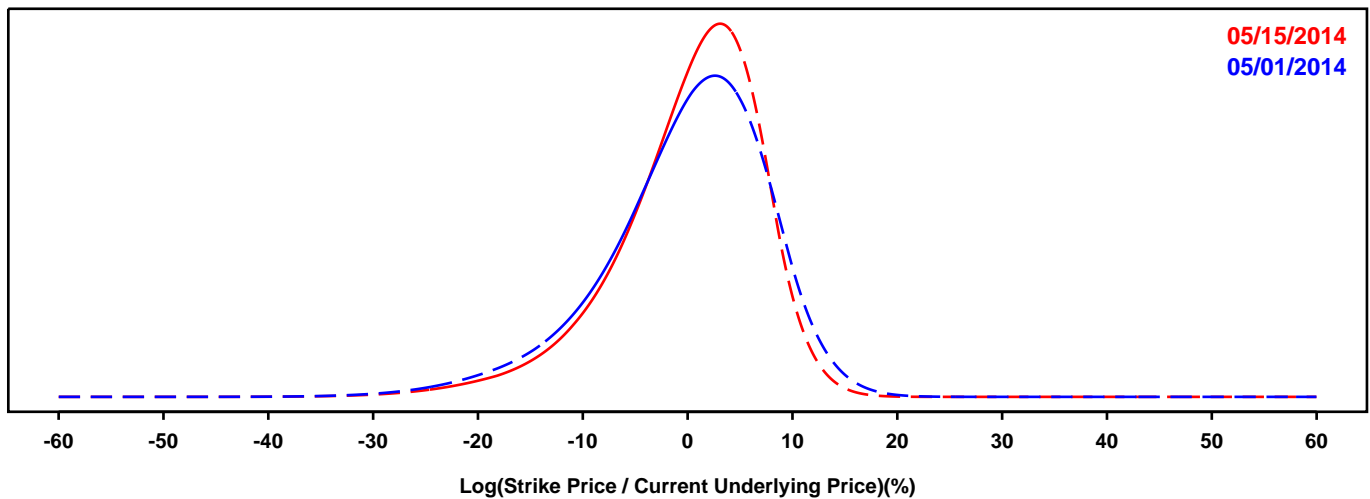
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- ALLSTATE

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

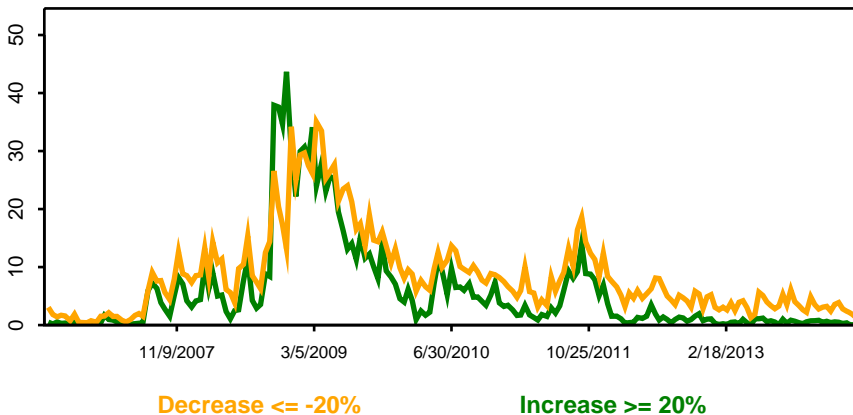
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

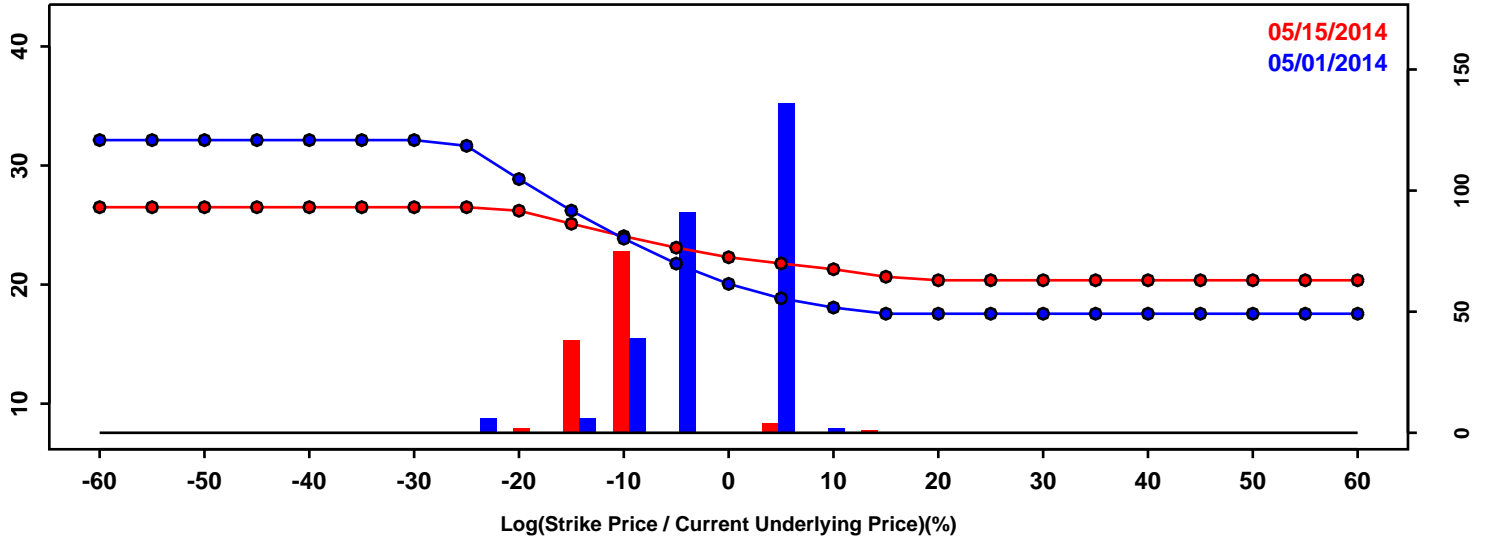


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-10.54%	-9.26%	1.28%
50th Pct	0.86%	1.11%	0.25%
90th Pct	8.76%	7.80%	-0.96%
Mean	-0.14%	0.05%	0.19%
Std Dev	7.88%	7.08%	-0.80%
Skew	-0.79	-0.98	-0.19
Kurtosis	1.08	1.65	0.57

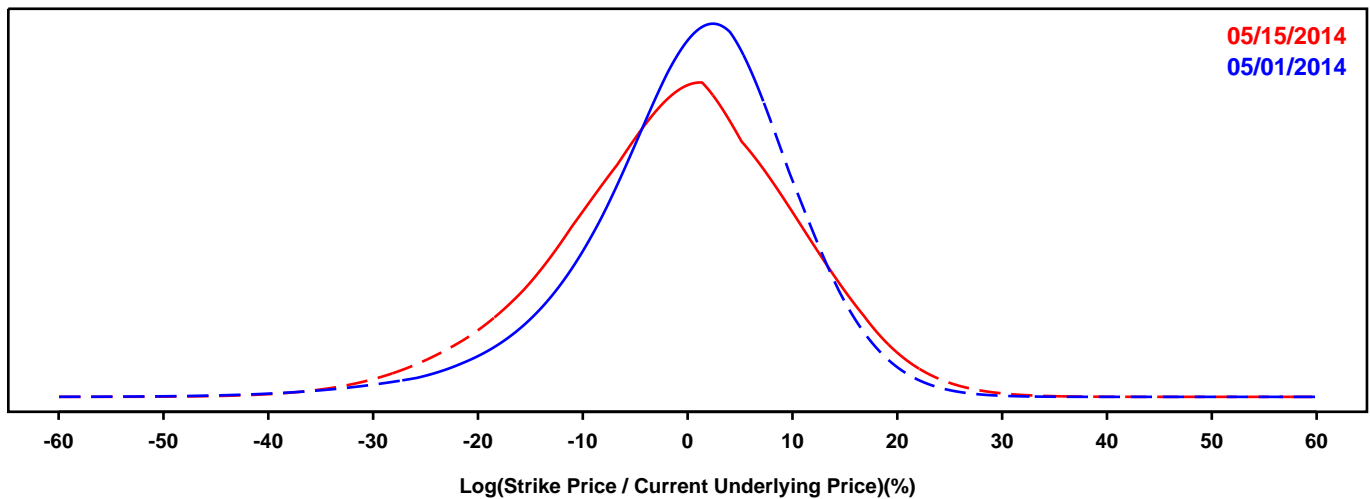
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- AMERIPRISE

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

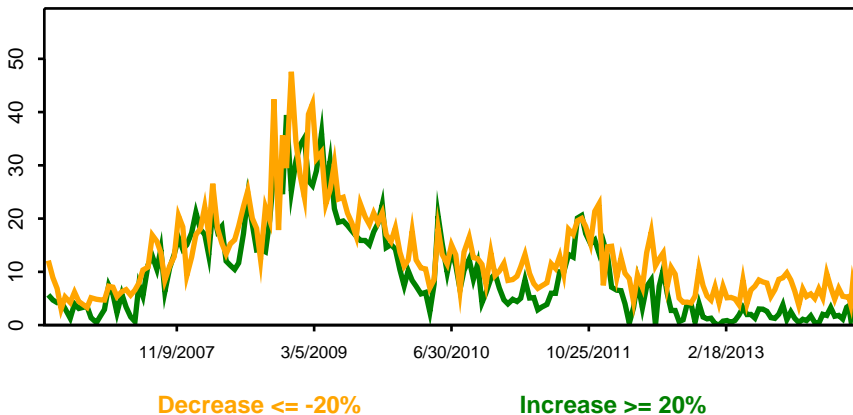
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

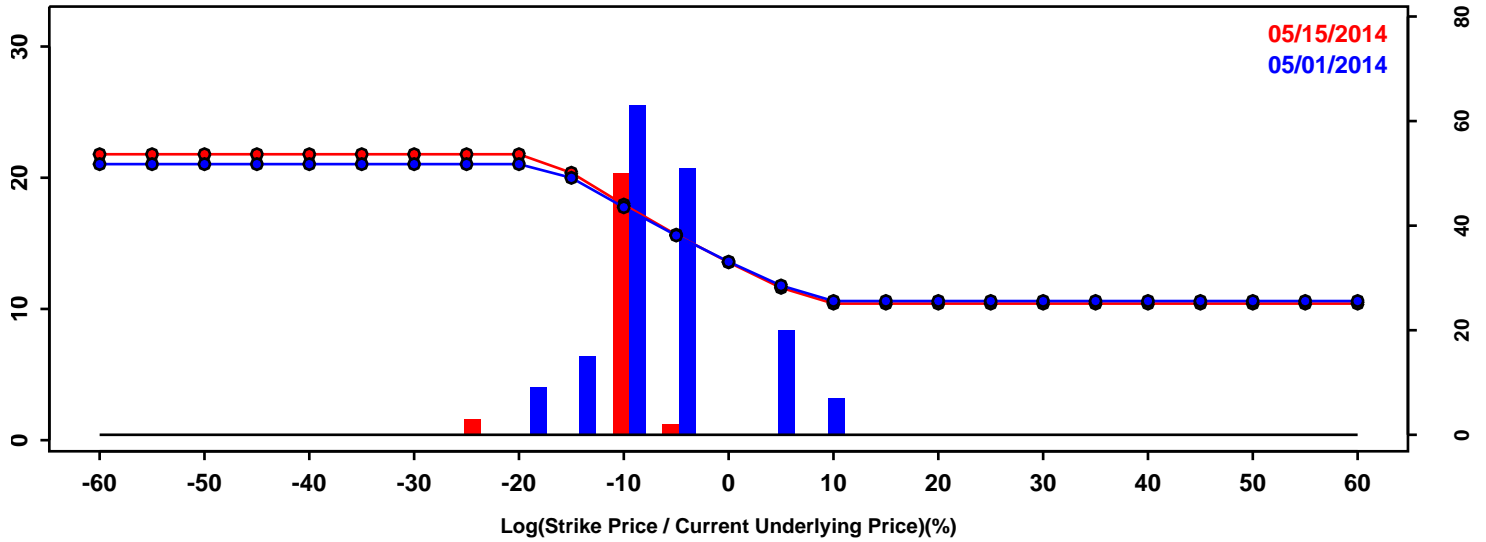


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-12.77%	-16.04%	-3.27%
50th Pct	1.02%	-0.57%	-1.59%
90th Pct	11.77%	12.87%	1.09%
Mean	0.07%	-1.19%	-1.26%
Std Dev	10.15%	11.37%	1.22%
Skew	-0.73	-0.32	0.42
Kurtosis	1.50	0.30	-1.20

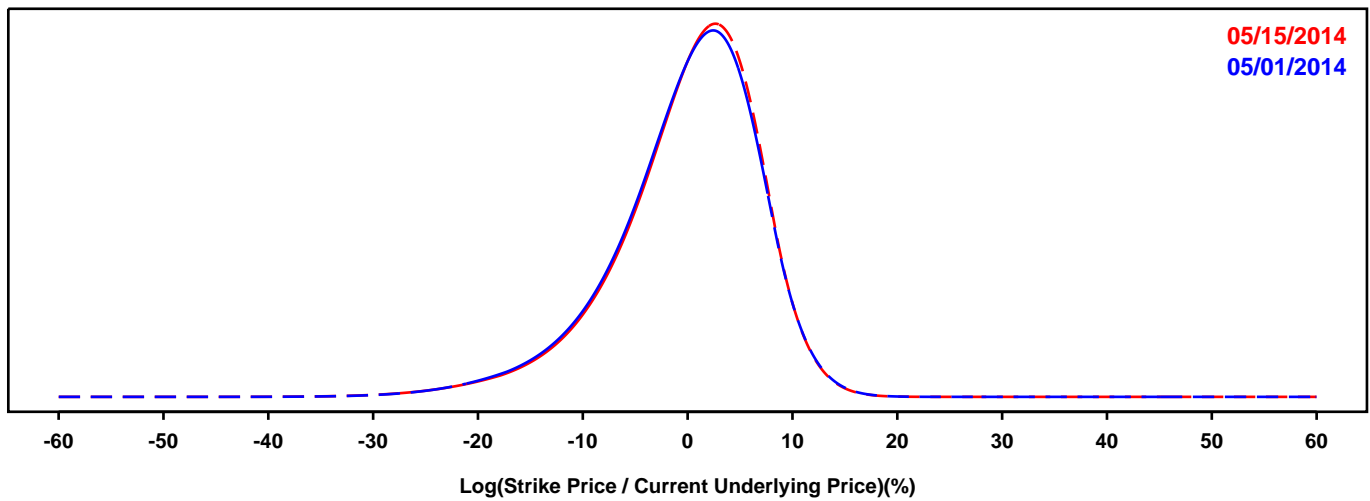
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- CHUBB

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

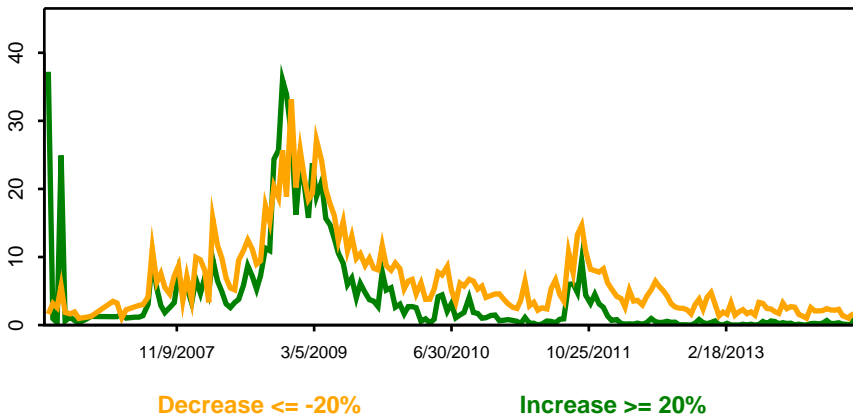
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

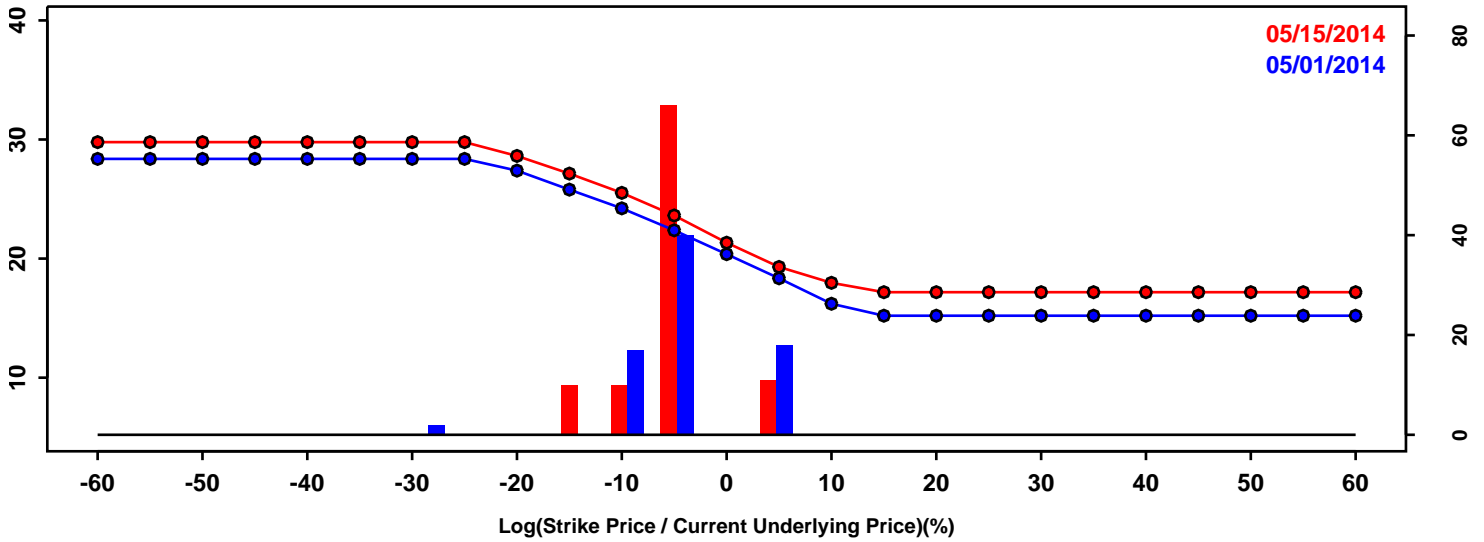


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-9.33%	-9.09%	0.24%
50th Pct	0.77%	0.95%	0.19%
90th Pct	7.65%	7.65%	0.00%
Mean	-0.16%	-0.03%	0.13%
Std Dev	7.00%	6.95%	-0.04%
Skew	-0.88	-0.94	-0.06
Kurtosis	1.40	1.62	0.22

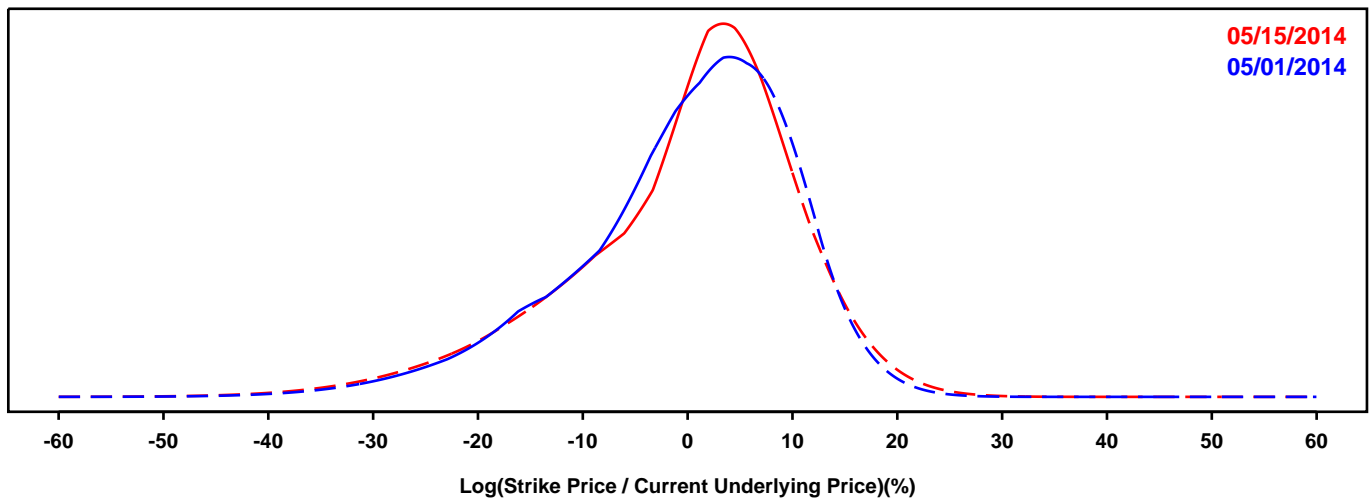
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- PRINCIPAL FINANCIAL

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

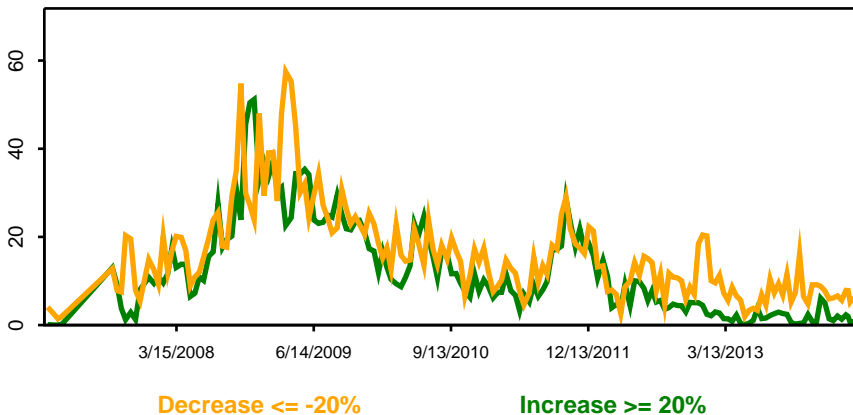
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

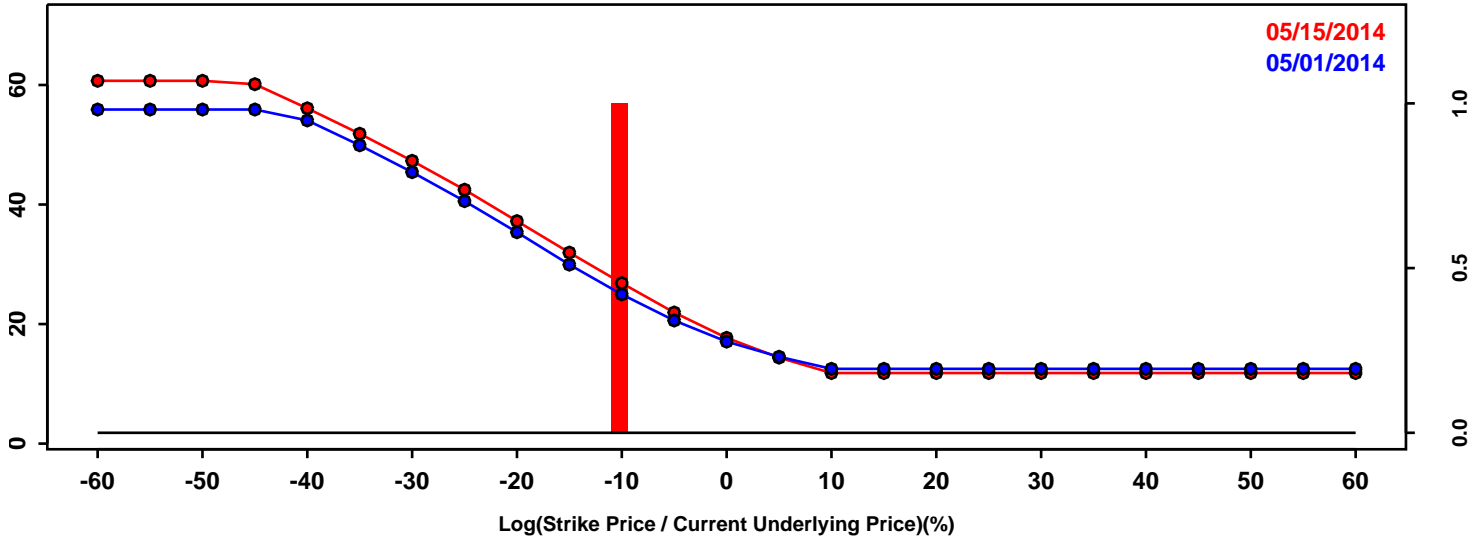


Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-15.04%	-15.57%	-0.53%
50th Pct	1.39%	1.63%	0.25%
90th Pct	11.48%	11.81%	0.33%
Mean	-0.28%	-0.27%	0.02%
Std Dev	10.57%	11.01%	0.44%
Skew	-0.82	-0.84	-0.02
Kurtosis	0.85	1.02	0.17

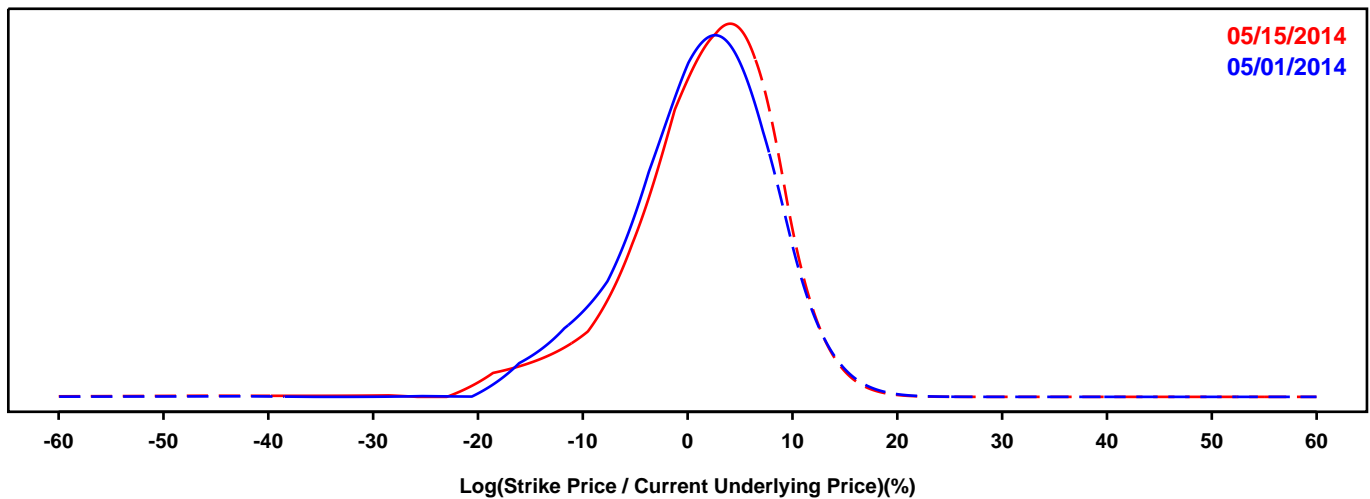
RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- PROGRESSIVE

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

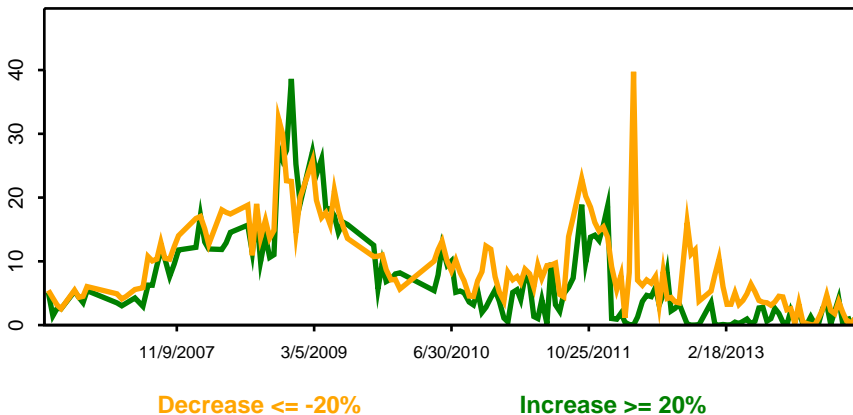
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



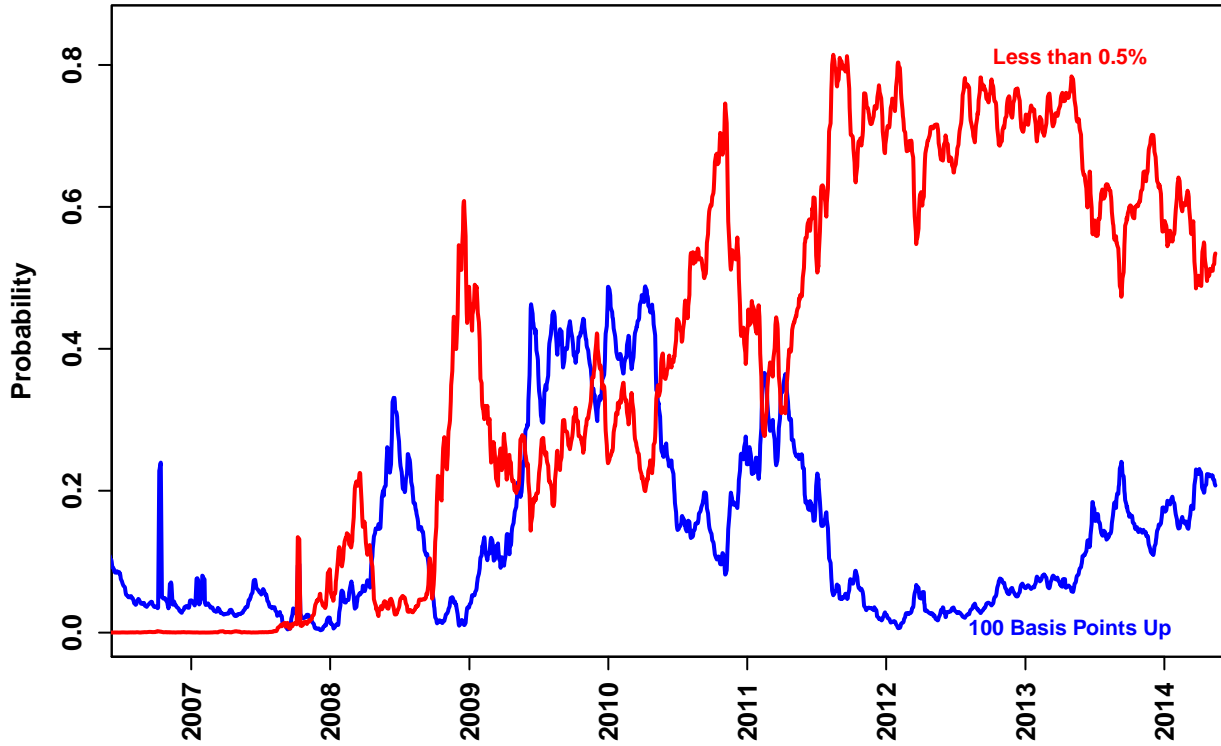
Probability of a Large Change



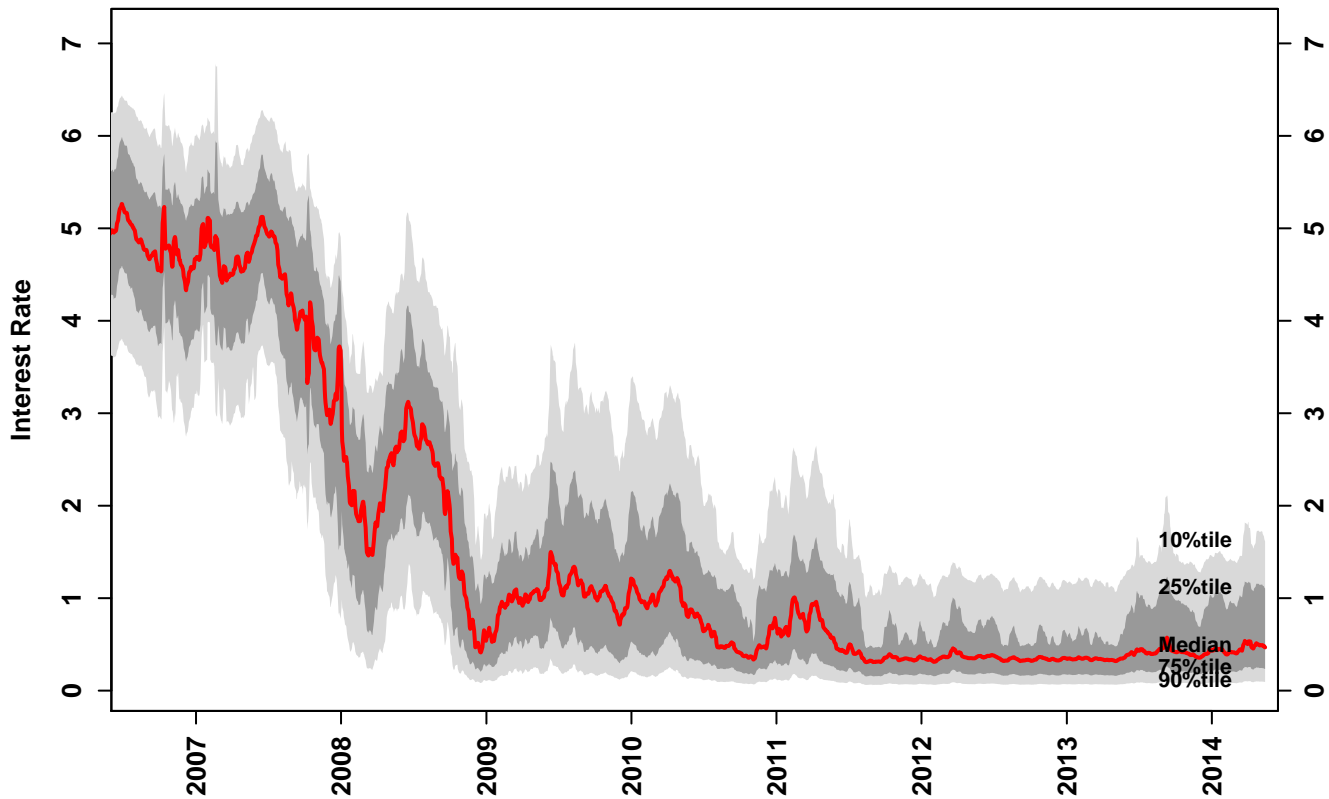
Statistics of the Log Return Distributions			
	05/01/2014	05/15/2014	Change
10th Pct	-8.40%	-7.87%	0.54%
50th Pct	1.60%	2.24%	0.64%
90th Pct	9.18%	9.30%	0.12%
Mean	0.94%	1.19%	0.25%
Std Dev	7.22%	8.03%	0.81%
Skew	-1.20	-2.37	-1.16
Kurtosis	7.33	15.26	7.93

MARKET PROBABILITY DENSITY FUNCTIONS -- Interest Rate Caps & Floors

Probability of Large Moves for 3-Month LIBOR, 2 Years Out 5-Day Rolling Average

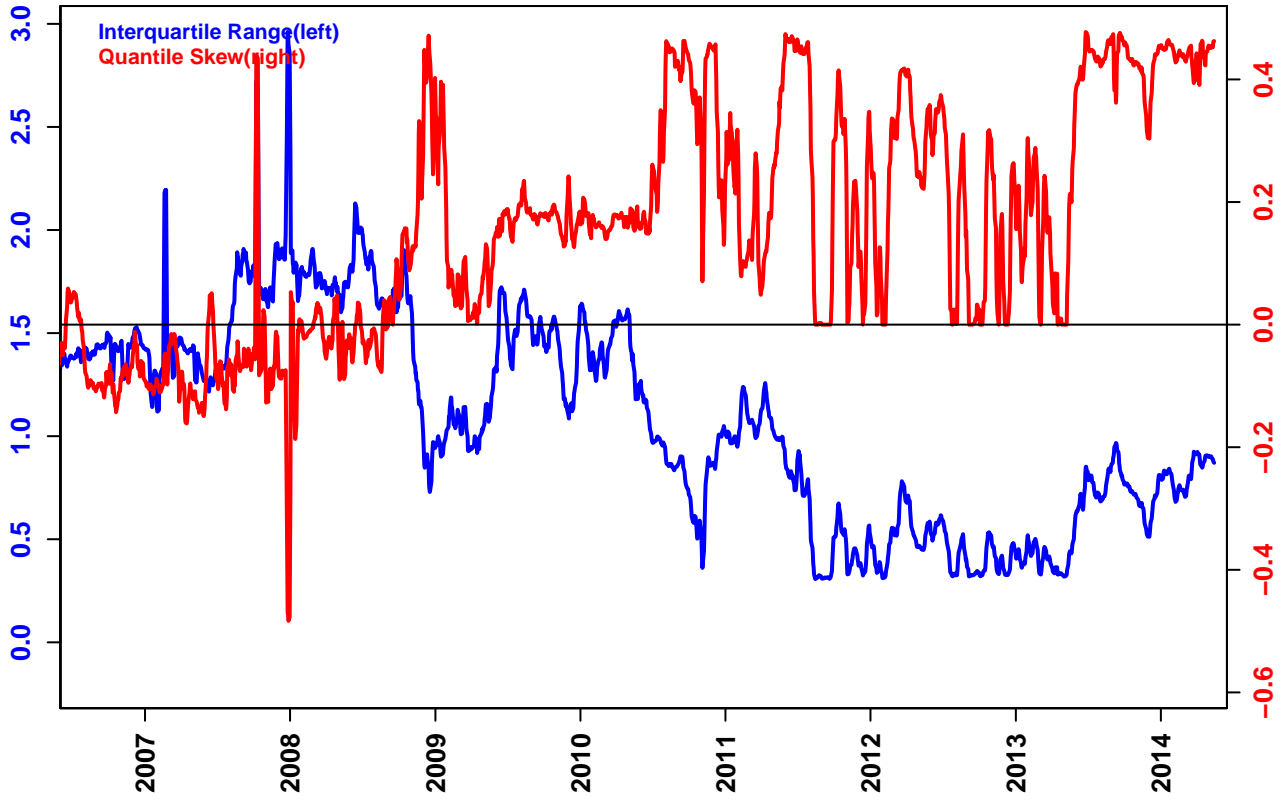


Distribution for LIBOR over 2 Years 5-Day Rolling Average

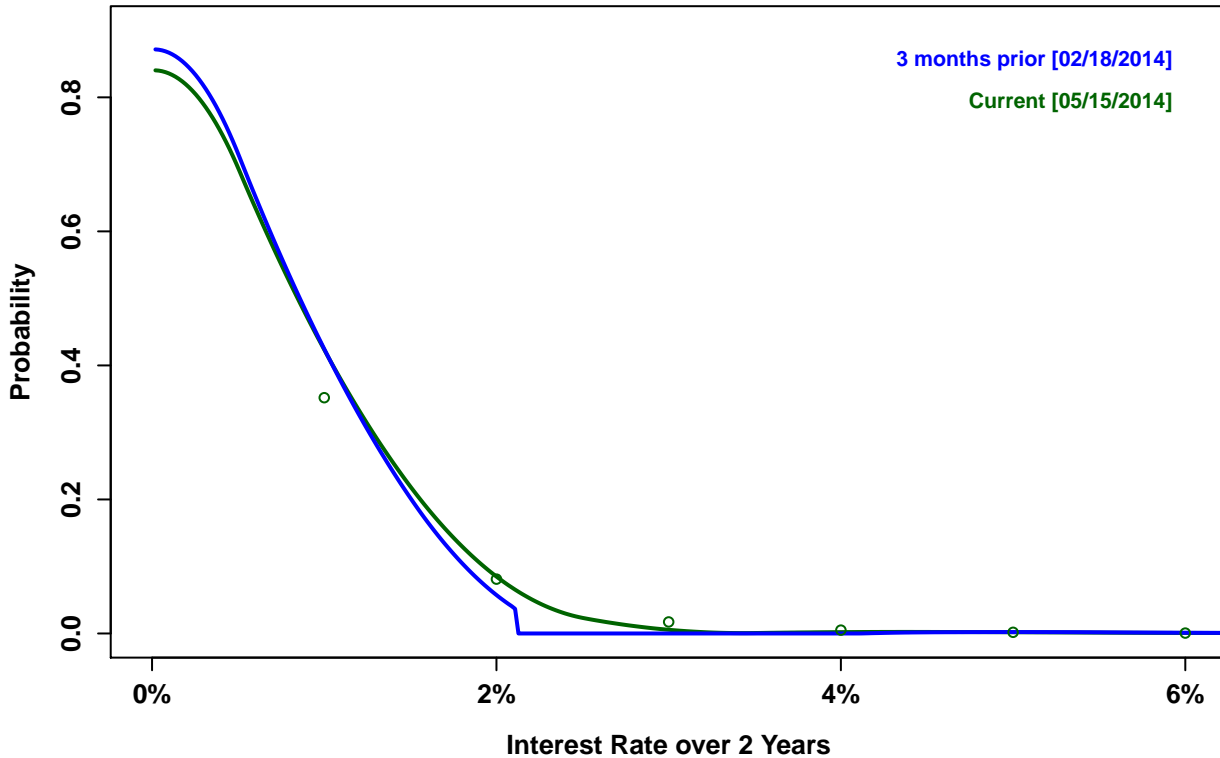


MARKET PROBABILITY DENSITY FUNCTIONS -- Interest Rate Caps & Floors

Dispersion and Skew for LIBOR over 2 Years 5-Day Rolling Average

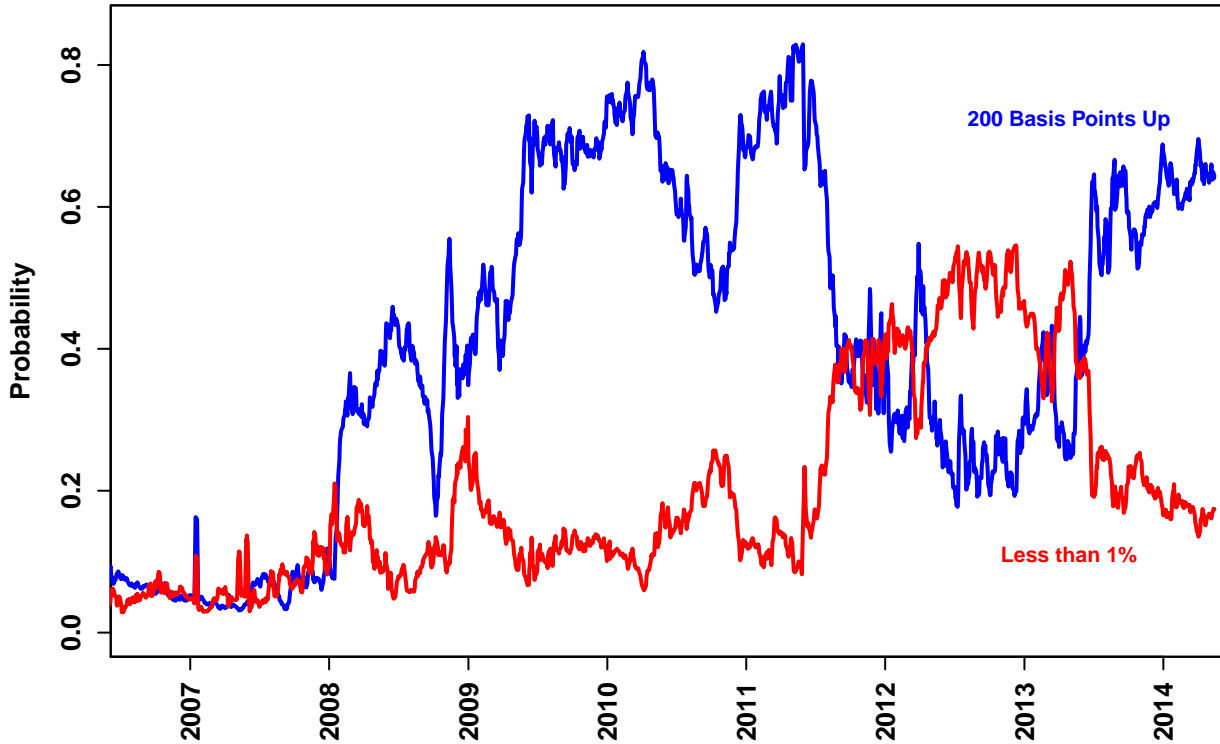


Market Probability Density Function for LIBOR over the Next 2 Years

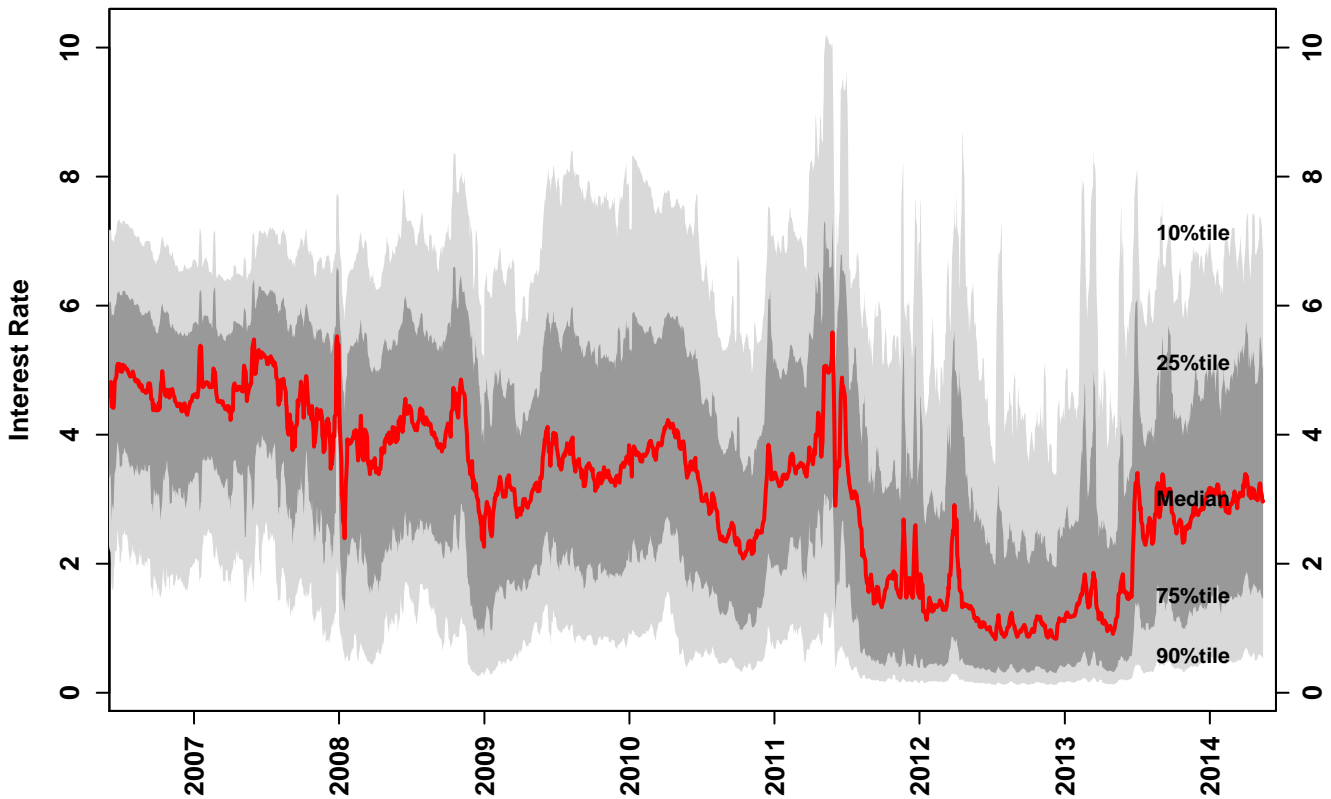


MARKET PROBABILITY DENSITY FUNCTIONS -- Interest Rate Caps & Floors

Probability of 200 Basis Point Moves for 3-Month LIBOR, 5 Years Out 5-Day Rolling Average

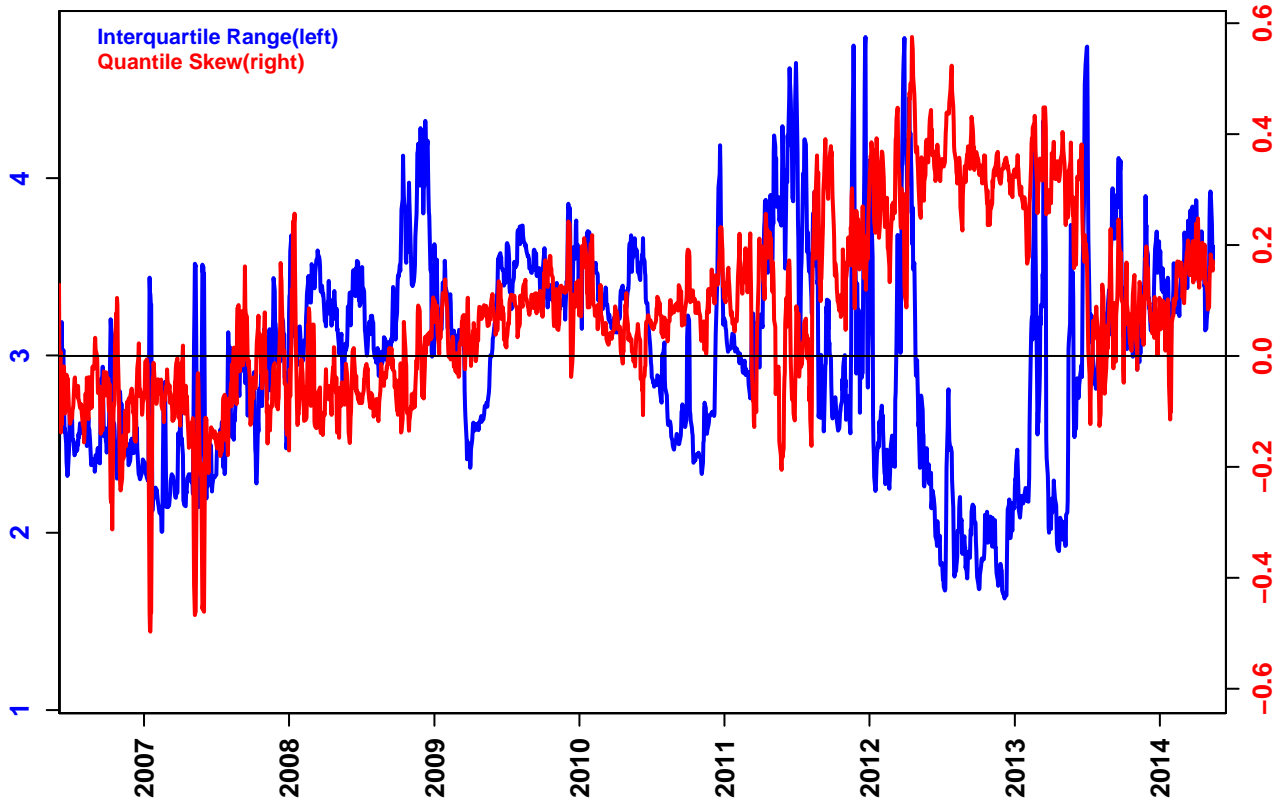


Distribution for LIBOR over 5 Years 5-Day Rolling Average



MARKET PROBABILITY DENSITY FUNCTIONS -- Interest Rate Caps & Floors

Dispersion and Skew for LIBOR over 5 Years 5-Day Rolling Average



Market Probability Density Function for LIBOR over the Next 5 Years

