

FEDERAL RESERVE BANK OF MINNEAPOLIS  
BANKING AND POLICY STUDIES

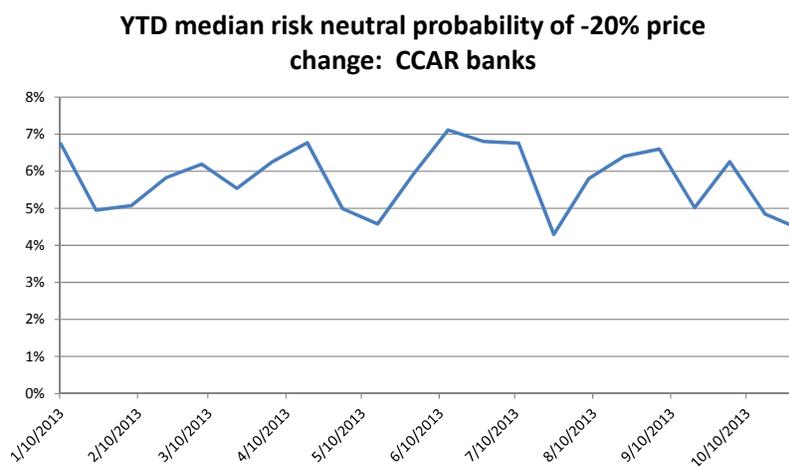
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## Minneapolis Options Report – October 31<sup>st</sup>

### *Banks & Insurance Companies*

Banks and insurance company stock performance lagged the broader S&P 500 index over the past two weeks. The S&P 500 rose 1.35% while the average CCAR bank fell -0.49%. The average price of the five insurance companies we follow fell -0.98%.

Trading was extremely light. Of the 95 periods we have measured, the trading over the last two weeks was nearly the lowest. RNPD standard deviations dropped again. For banks and insurance companies, tail risks are at five year lows. Risk neutral probabilities of -20% price changes have again fallen below 5%.



#### Additional notes:

- Skews generally became less negative. Volatility smiles showed declines in implied volatility for options struck at prices below the current spot price.

### *Other Commodity Markets*

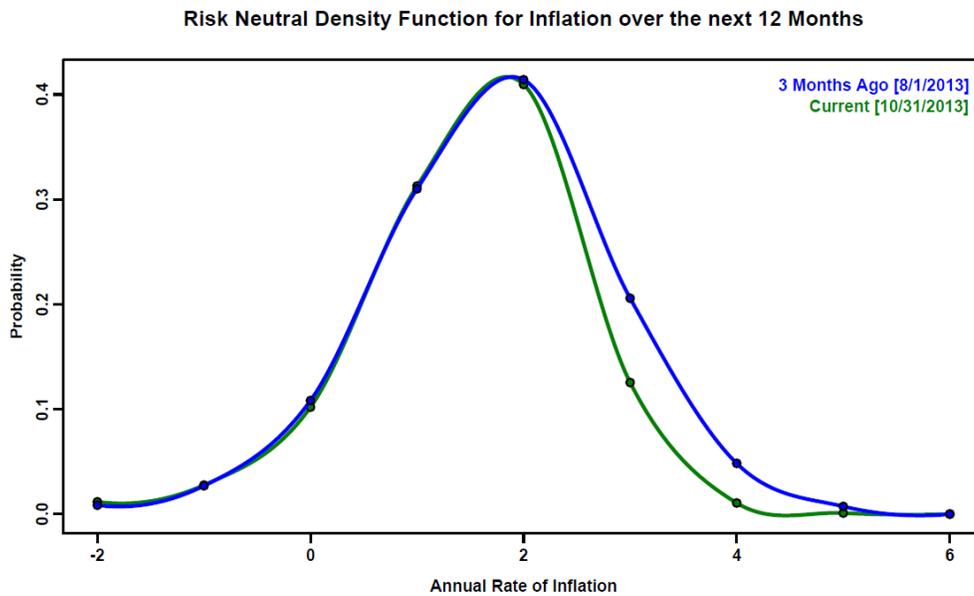
Trading levels in options on the S&P 500 index fell back from the recent increase recorded two weeks ago. Trading was strong in options on exchange rate futures and light for most other commodities. The lower tail risk trends we have reported remain in place.

#### Additional notes:

- Trading in options Dollar-Euro was the highest this year and third highest since 2011. Trading in options on Dollar-Pound and Yen-Dollar futures was similarly robust. RNPD

standard deviations derived from options on futures for all three exchange rates changed very little. (See *Exchange Rate Reports*)

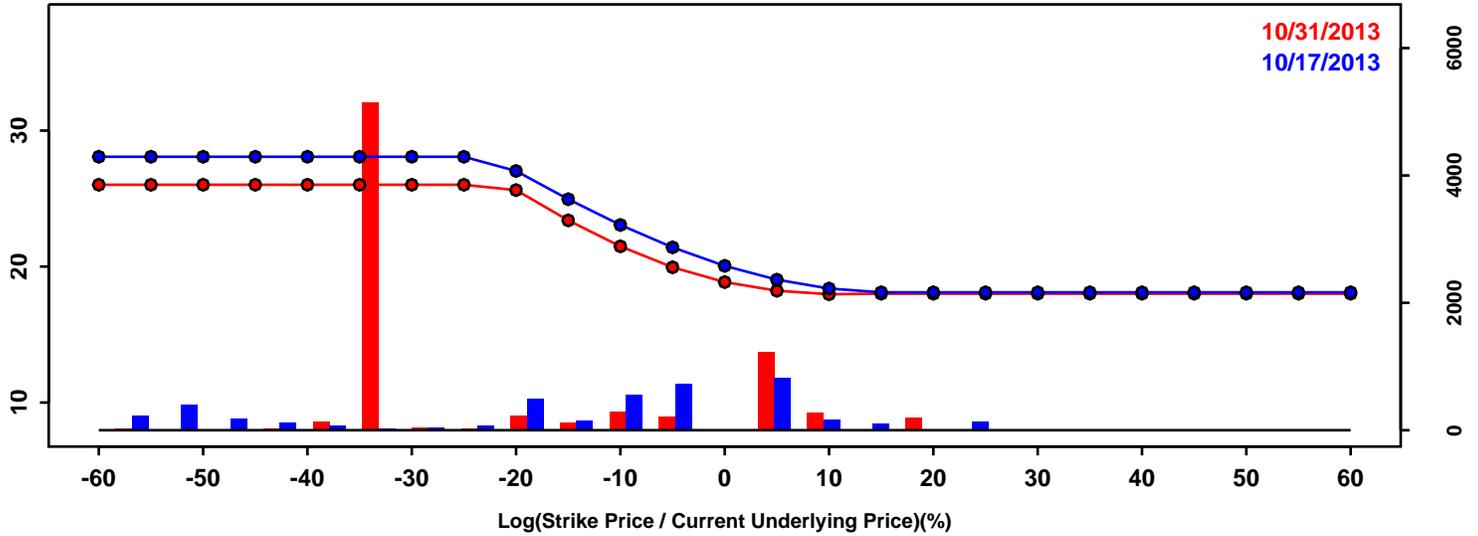
- Trading in options on grain futures was above average. Spot prices declined -3.6% for corn, -1.8% for soybeans, and -2.4% for wheat. RNPD attributes showed only minor changes. (See *individual reports for corn, soybeans, and wheat*)
- The RNPD standard deviation derived from options on The DJ Real Estate Index ETF fell another 30 basis points on heavy trading. (See *Real Estate Report*)
- The range of near-term inflation expectations has shrunk. The right tail of the RNPD has shifted toward lower rates.



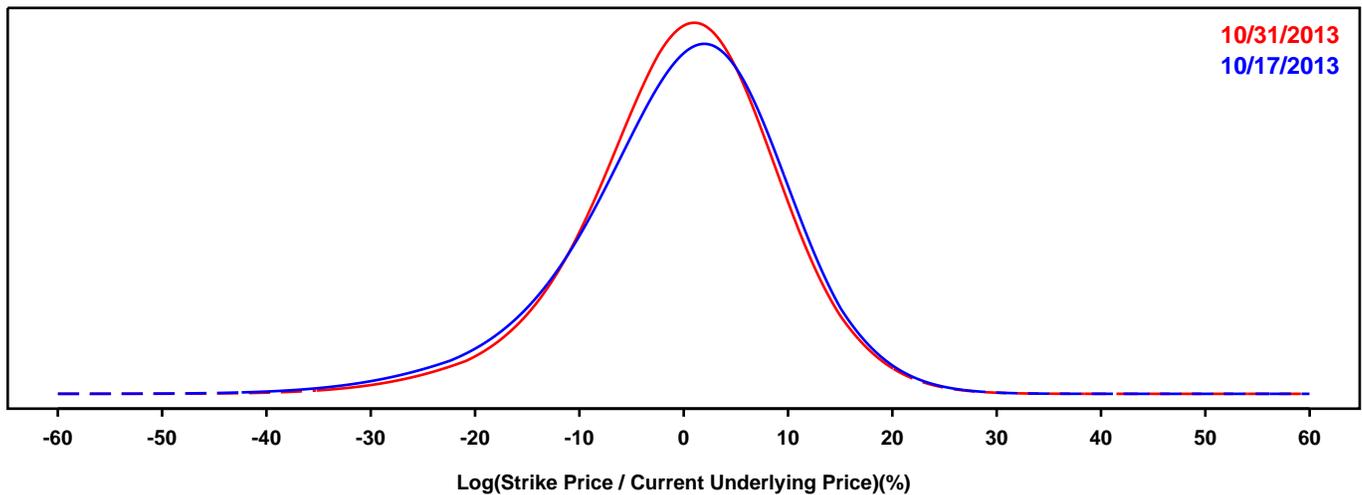
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- AMERICAN EXPRESS

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

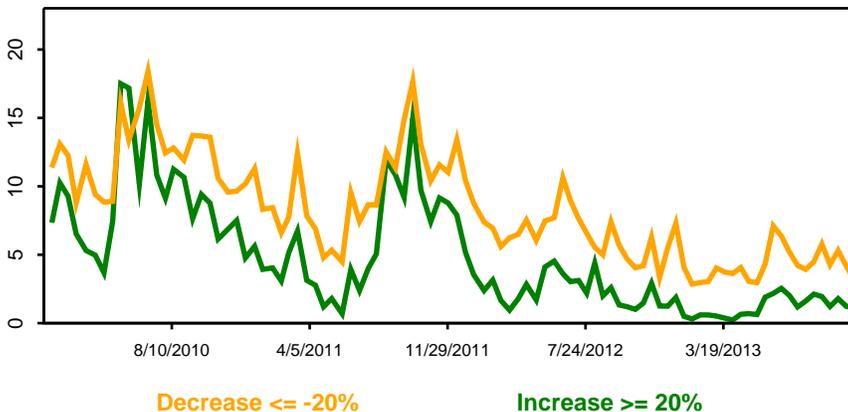
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

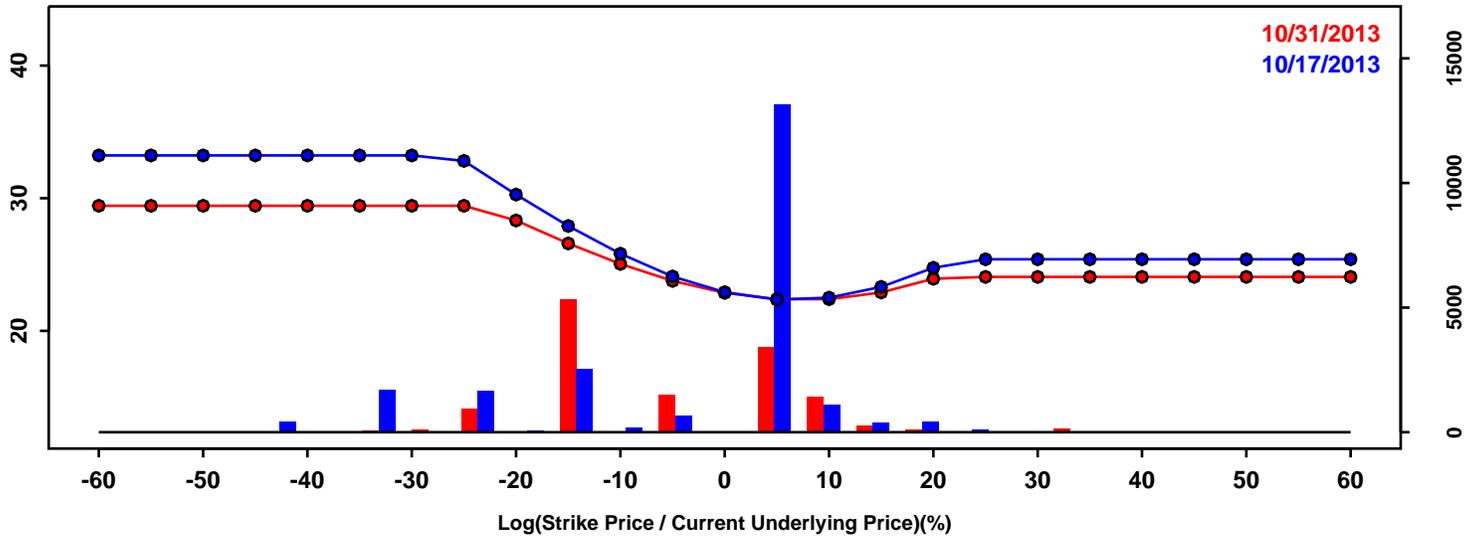


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-13.46%	-12.25%	1.21%
50th Pct	0.53%	0.29%	-0.24%
90th Pct	11.50%	11.04%	-0.46%
Mean	-0.36%	-0.27%	0.09%
Std Dev	10.18%	9.49%	-0.69%
Skew	-0.58	-0.45	0.13
Kurtosis	0.92	0.85	-0.07

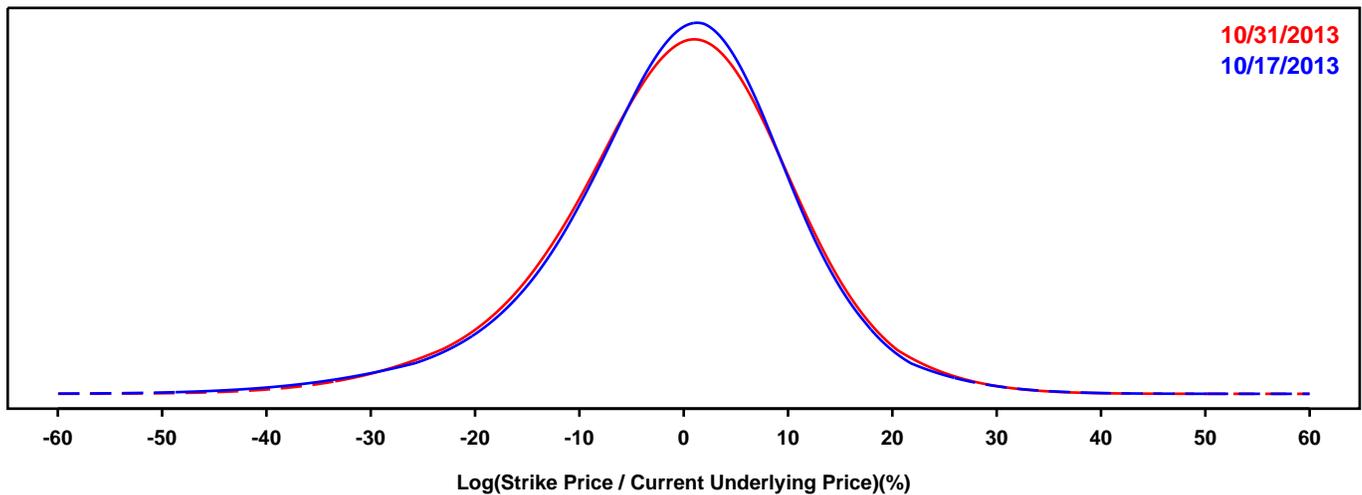
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- BANK OF AMERICA

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

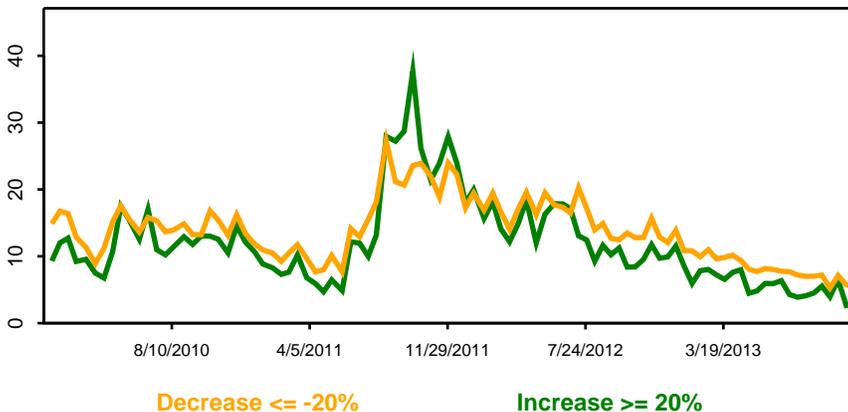
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

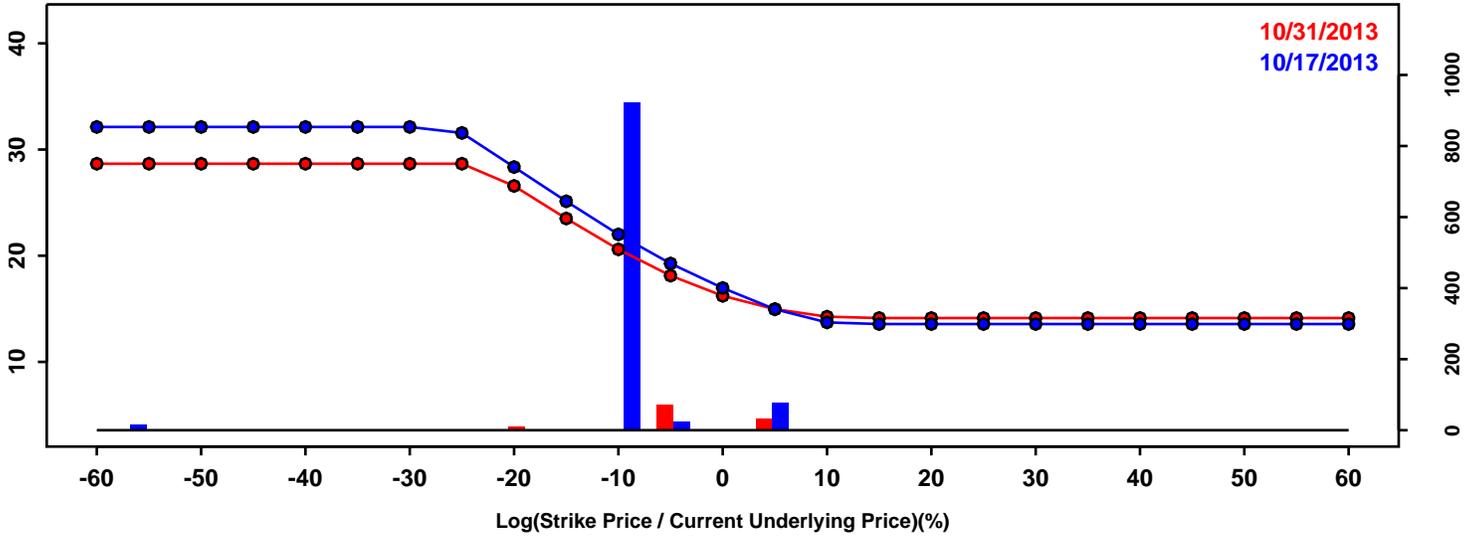


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-15.17%	-15.31%	-0.14%
50th Pct	0.08%	0.00%	-0.08%
90th Pct	12.57%	12.97%	0.40%
Mean	-0.75%	-0.66%	0.10%
Std Dev	11.57%	11.51%	-0.06%
Skew	-0.51	-0.36	0.15
Kurtosis	1.31	0.76	-0.55

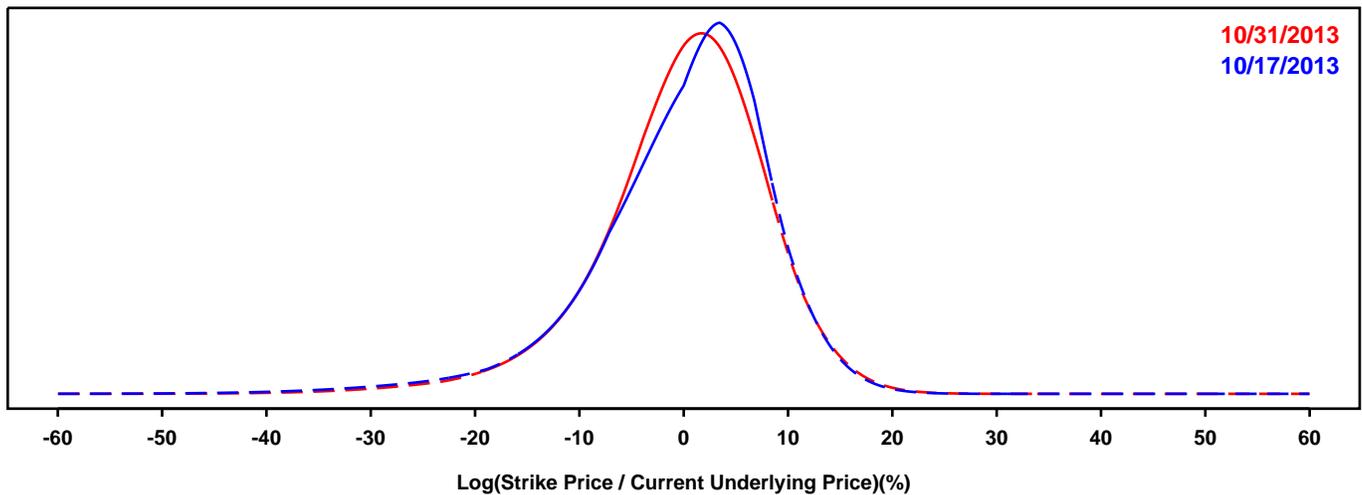
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- BB&T

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

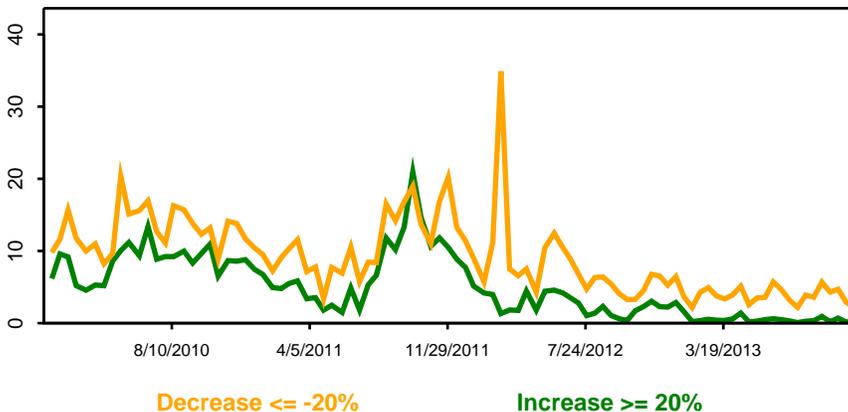
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

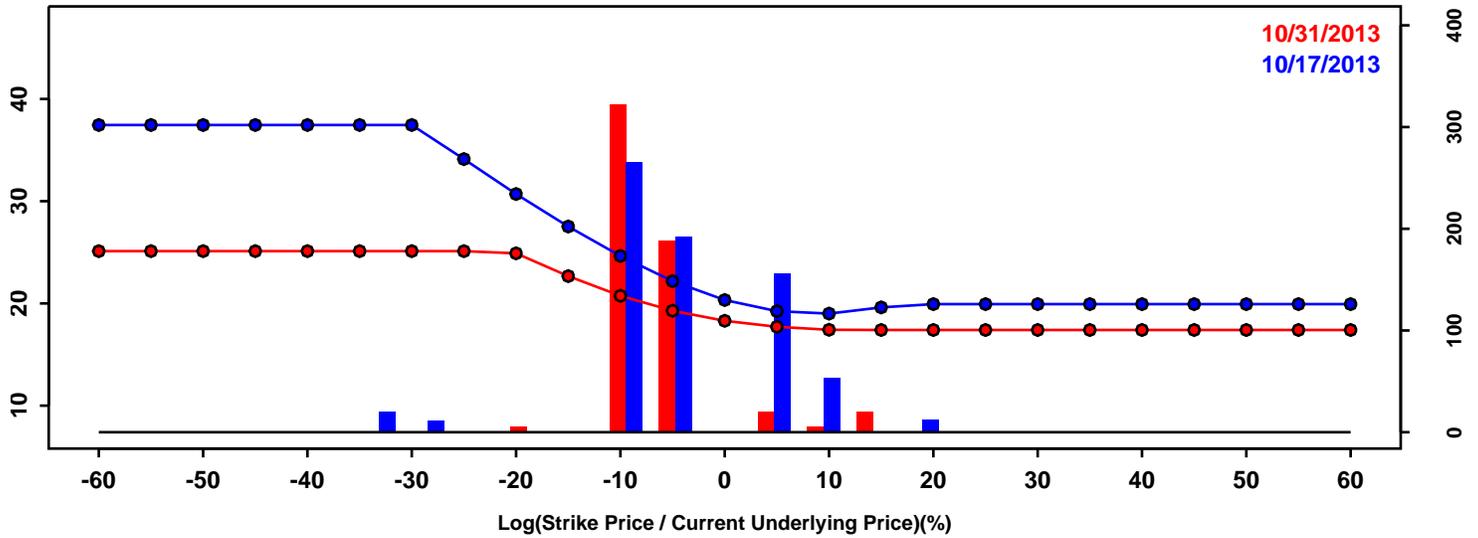


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-10.65%	-10.12%	0.53%
50th Pct	1.22%	0.71%	-0.50%
90th Pct	9.19%	9.19%	-0.00%
Mean	-0.07%	-0.04%	0.03%
Std Dev	8.62%	8.15%	-0.47%
Skew	-1.14	-0.84	0.30
Kurtosis	2.83	2.02	-0.81

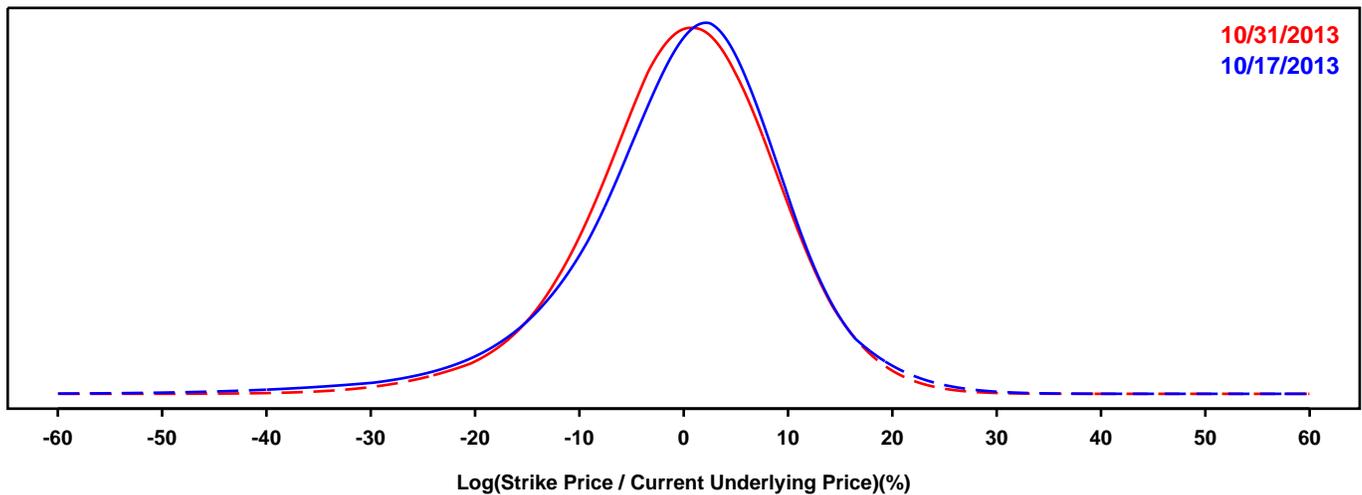
### RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- BANK OF NEW YORK MELLON

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

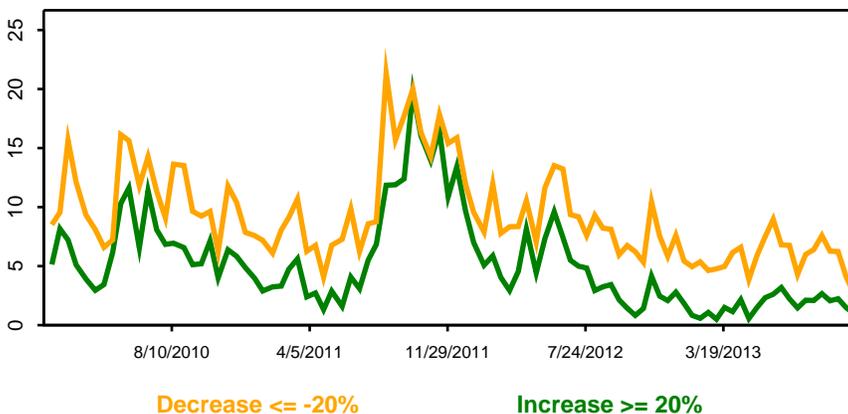
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

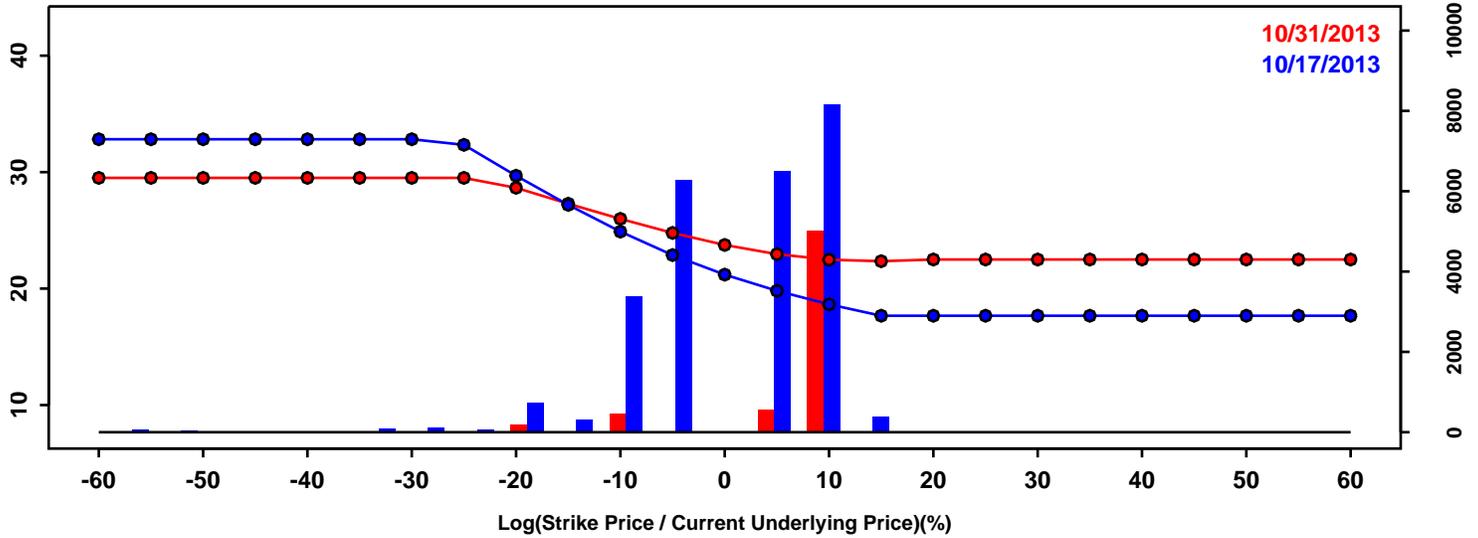


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-12.70%	-11.67%	1.03%
50th Pct	0.85%	0.30%	-0.55%
90th Pct	11.28%	10.89%	-0.38%
Mean	-0.14%	-0.11%	0.03%
Std Dev	10.29%	9.16%	-1.13%
Skew	-0.85	-0.40	0.44
Kurtosis	2.38	0.78	-1.61

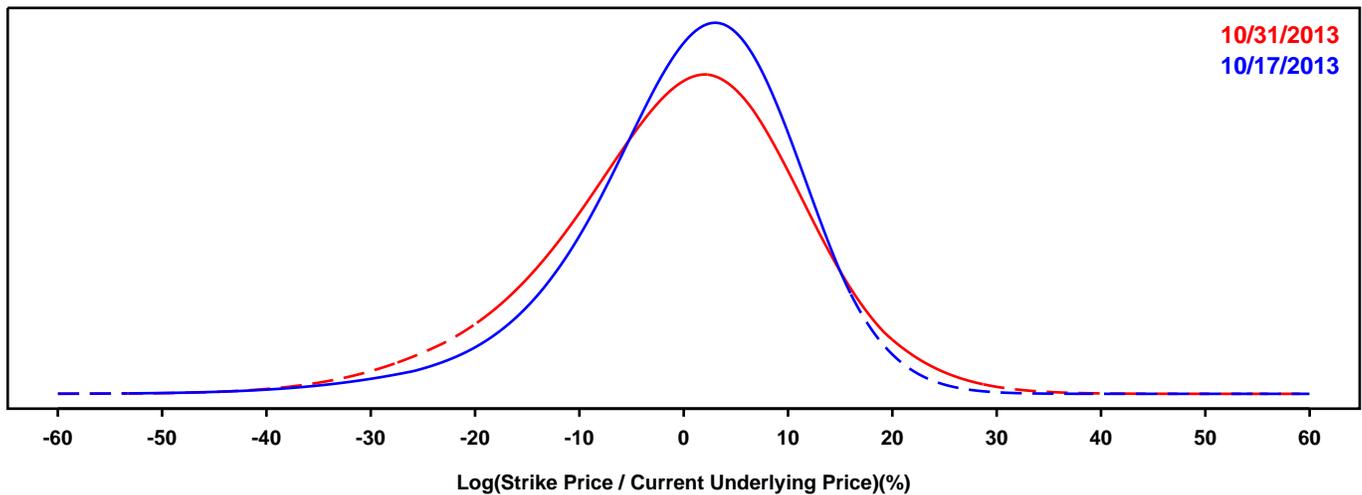
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- CITIGROUP

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

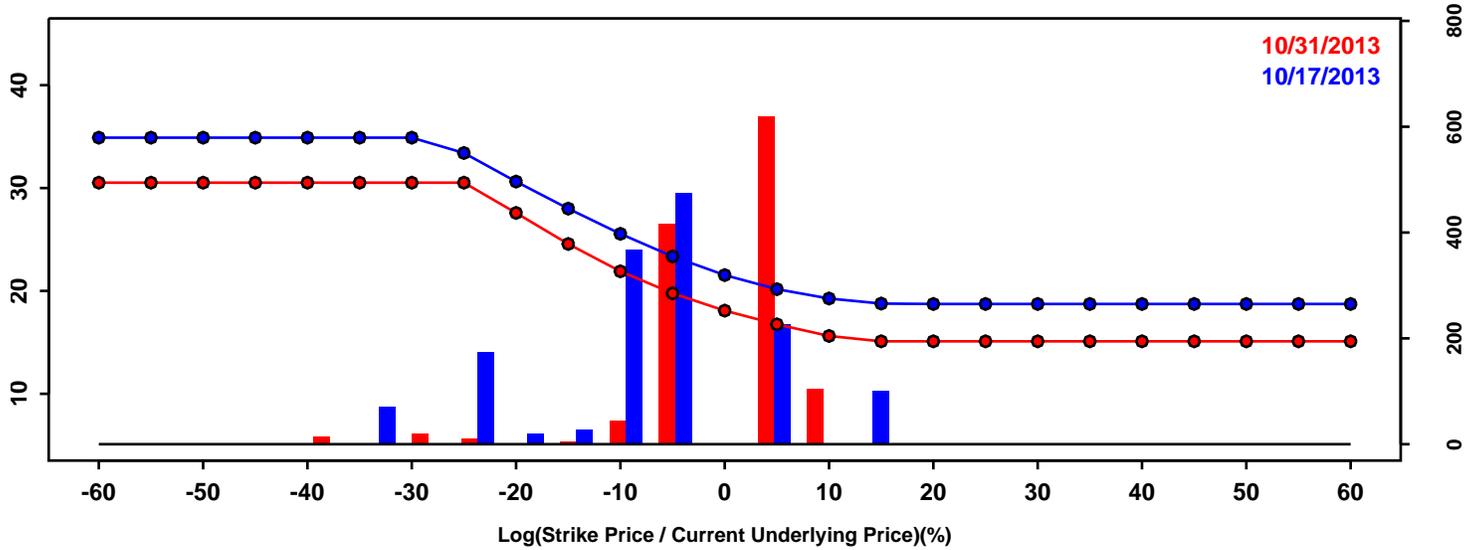


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-13.29%	-16.41%	-3.12%
50th Pct	1.37%	0.28%	-1.09%
90th Pct	12.62%	13.66%	1.04%
Mean	0.32%	-0.63%	-0.96%
Std Dev	10.68%	12.03%	1.34%
Skew	-0.75	-0.41	0.33
Kurtosis	1.36	0.52	-0.84

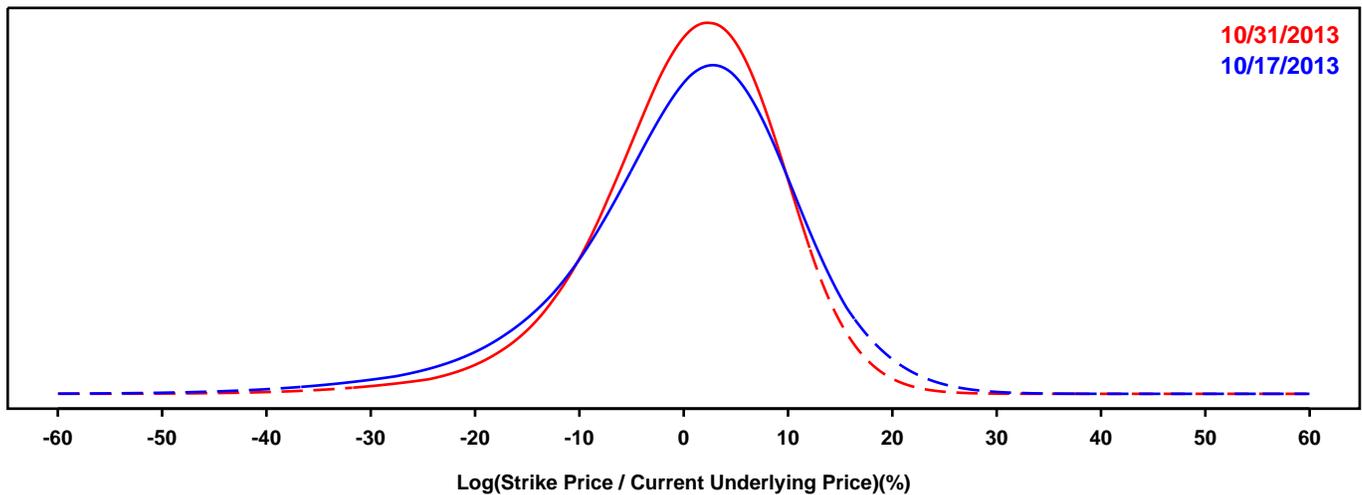
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- CAPITAL ONE

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

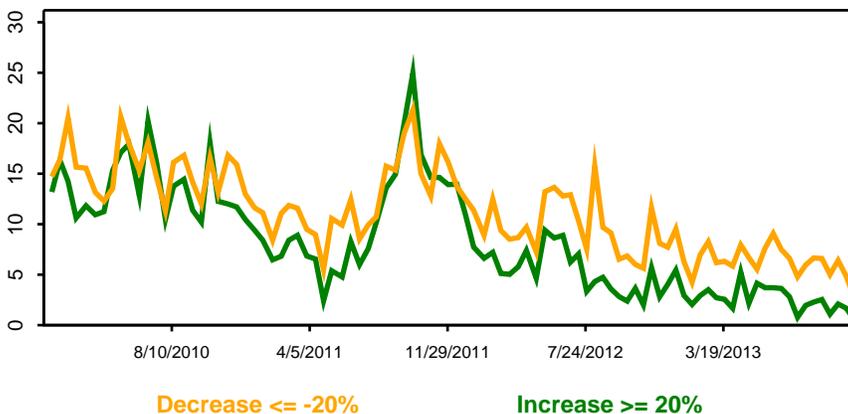
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

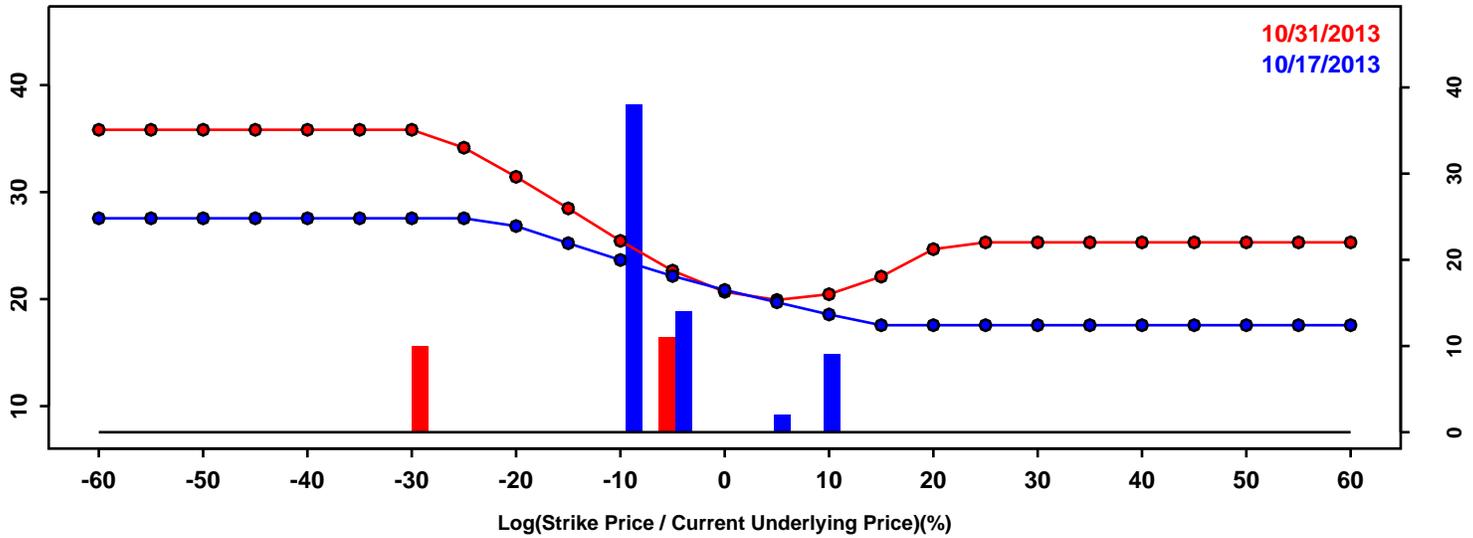


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-13.71%	-11.15%	2.55%
50th Pct	1.22%	1.07%	-0.15%
90th Pct	12.43%	10.73%	-1.70%
Mean	0.07%	0.26%	0.18%
Std Dev	10.92%	9.08%	-1.84%
Skew	-0.81	-0.76	0.05
Kurtosis	1.67	1.58	-0.10

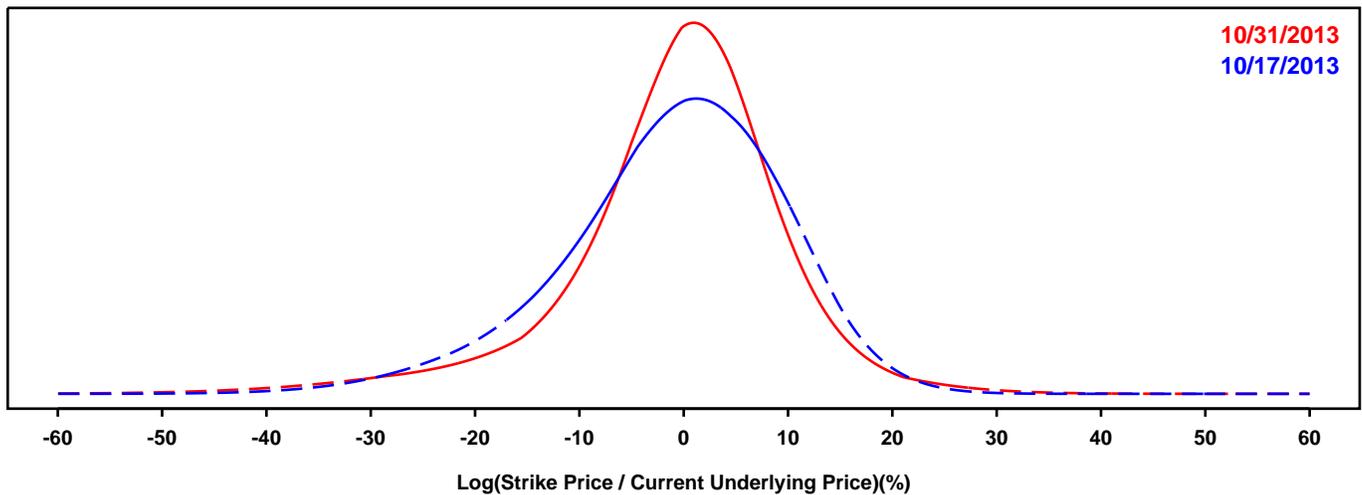
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- FIFTH THIRD

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

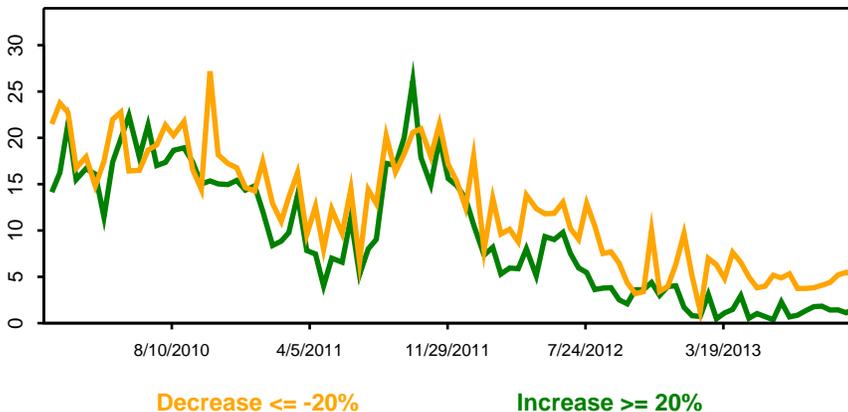
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

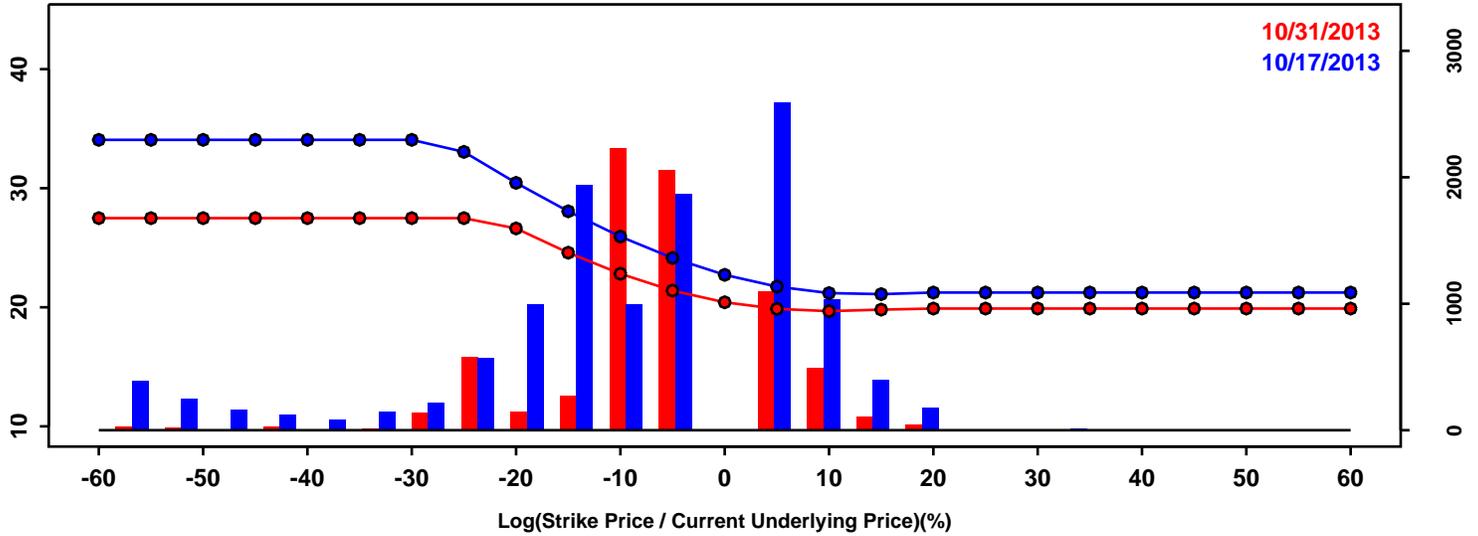


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-15.22%	-13.29%	1.93%
50th Pct	-0.04%	0.28%	0.32%
90th Pct	11.72%	10.62%	-1.10%
Mean	-1.01%	-0.78%	0.23%
Std Dev	10.76%	10.67%	-0.08%
Skew	-0.57	-0.92	-0.35
Kurtosis	0.61	2.79	2.18

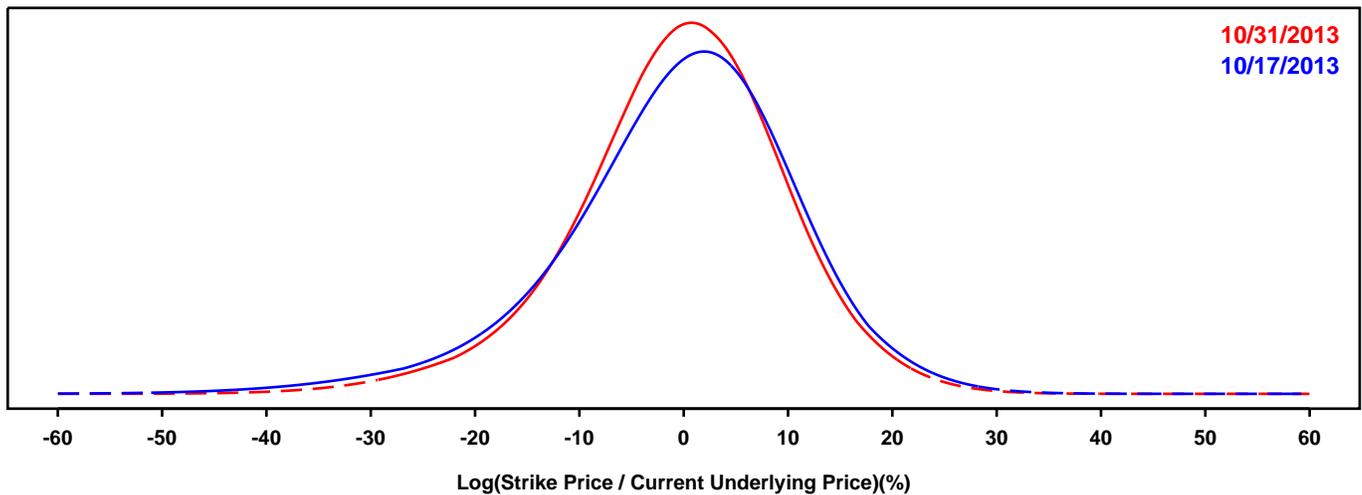
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- GOLDMAN SACHS

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

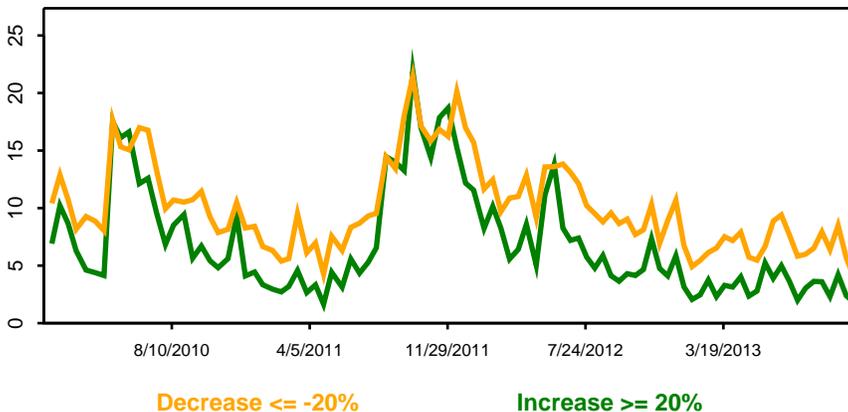
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

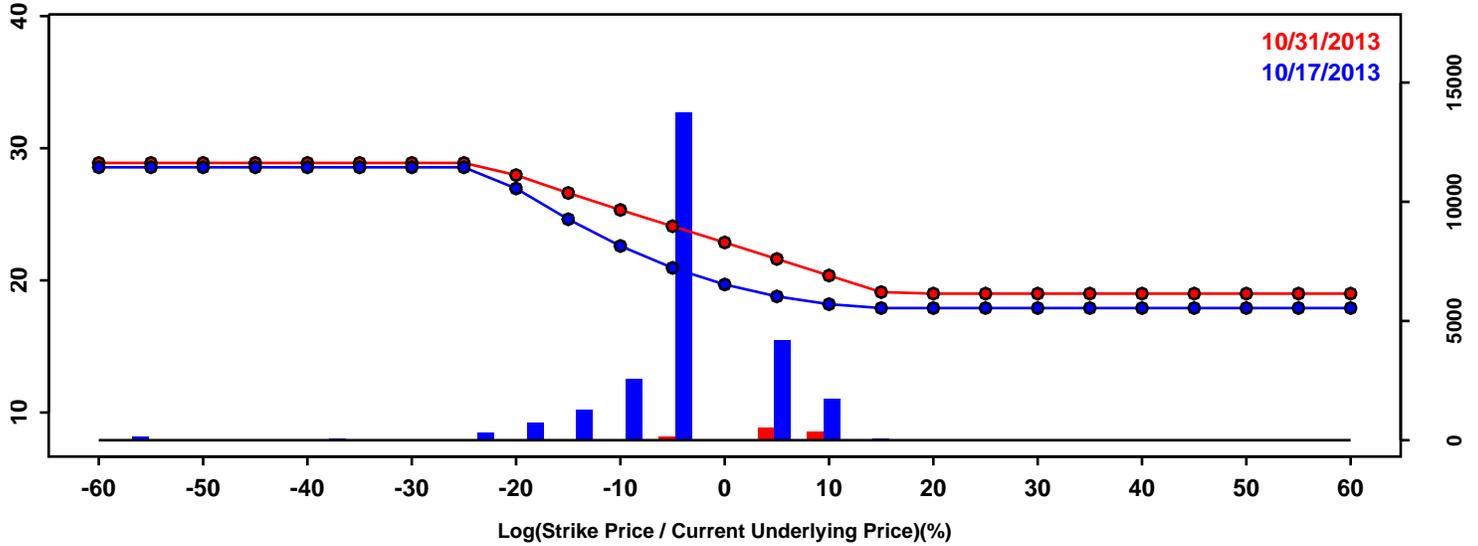


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-15.10%	-13.28%	1.82%
50th Pct	0.49%	0.15%	-0.34%
90th Pct	12.84%	11.91%	-0.93%
Mean	-0.50%	-0.36%	0.13%
Std Dev	11.55%	10.25%	-1.29%
Skew	-0.63	-0.40	0.23
Kurtosis	1.25	0.80	-0.45

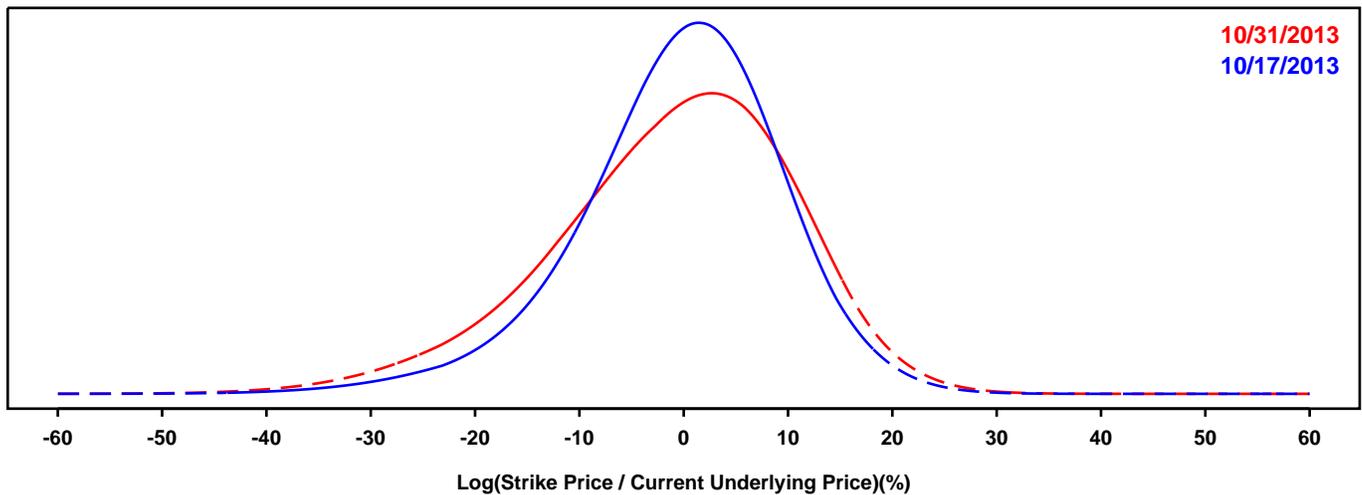
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- JP MORGAN

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

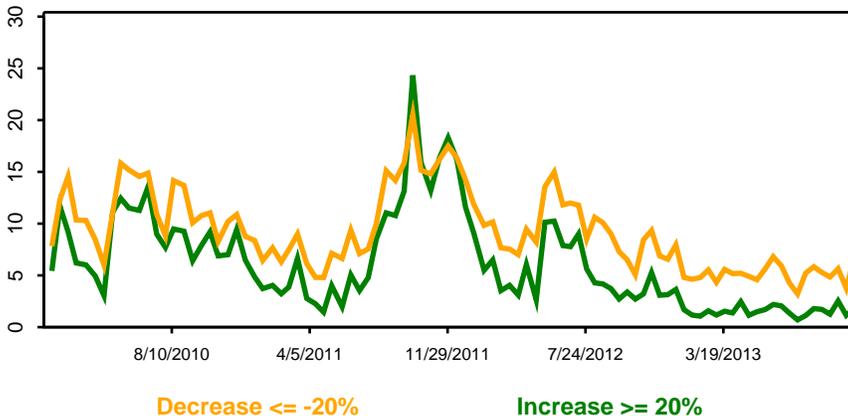
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

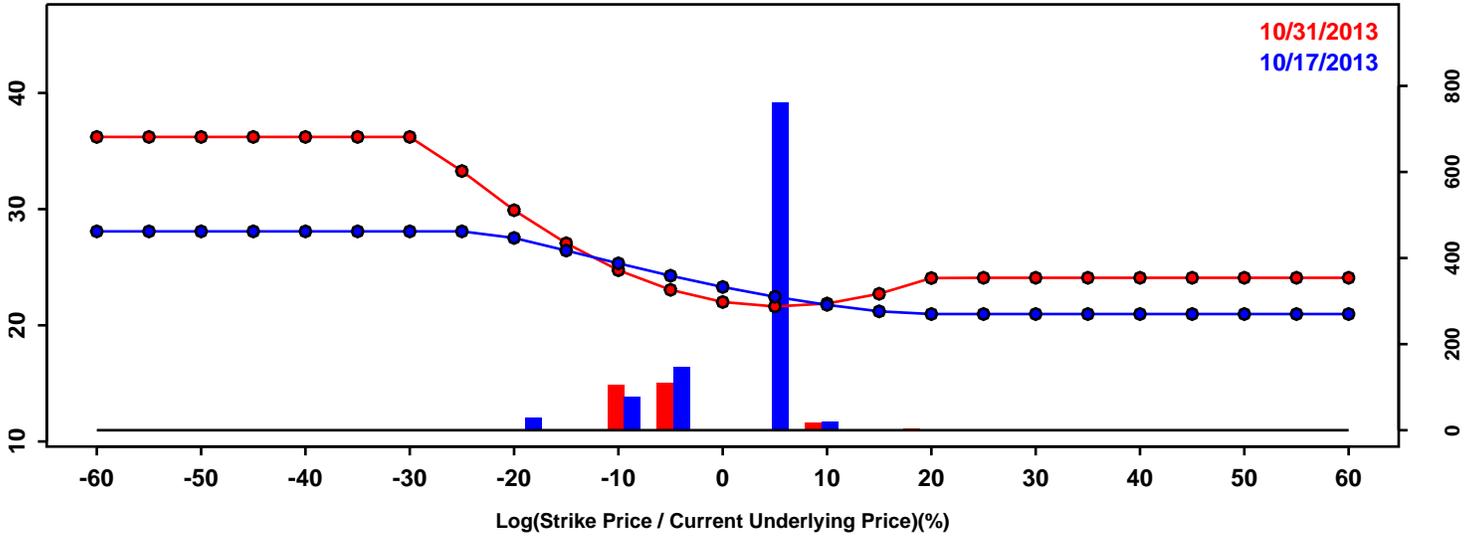


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-12.99%	-16.70%	-3.71%
50th Pct	0.37%	0.04%	-0.33%
90th Pct	11.33%	12.83%	1.51%
Mean	-0.38%	-1.09%	-0.71%
Std Dev	9.96%	11.72%	1.77%
Skew	-0.56	-0.52	0.03
Kurtosis	0.99	0.41	-0.58

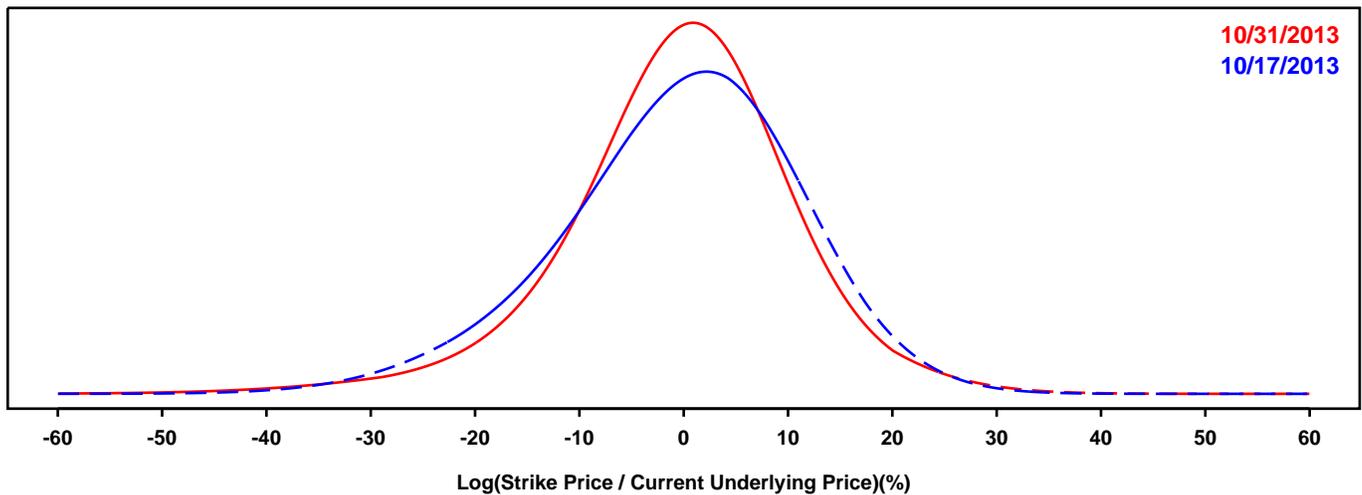
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- KEYCORP

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

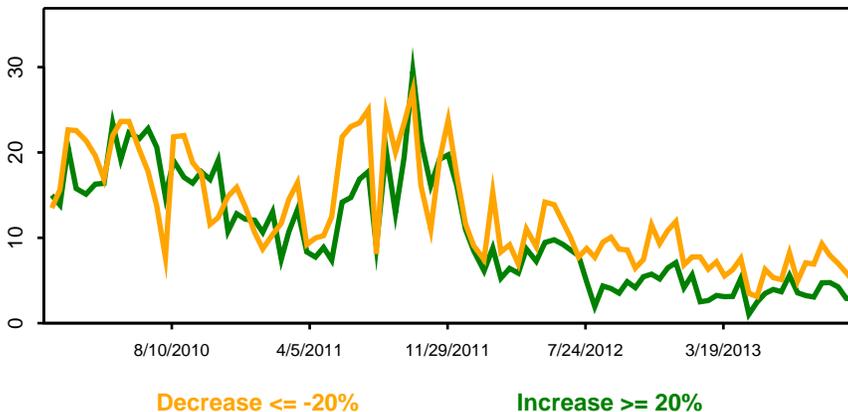
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

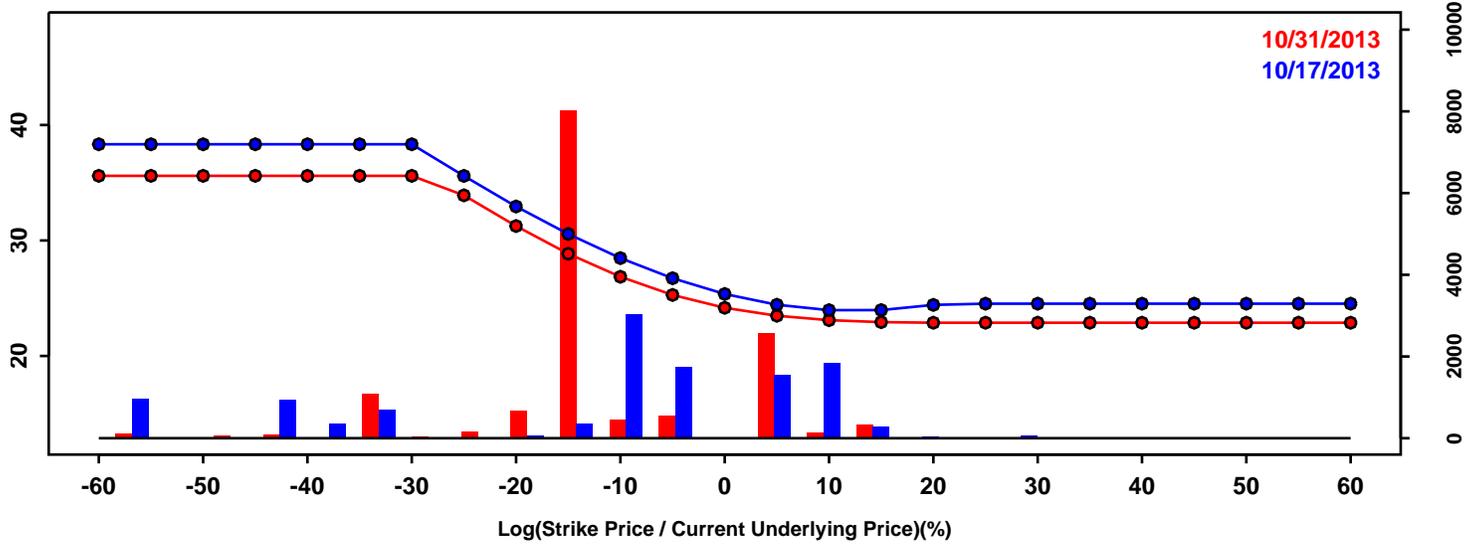


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-15.81%	-13.96%	1.85%
50th Pct	0.48%	0.24%	-0.24%
90th Pct	13.81%	12.63%	-1.17%
Mean	-0.33%	-0.37%	-0.04%
Std Dev	11.74%	11.24%	-0.50%
Skew	-0.39	-0.51	-0.11
Kurtosis	0.36	1.61	1.25

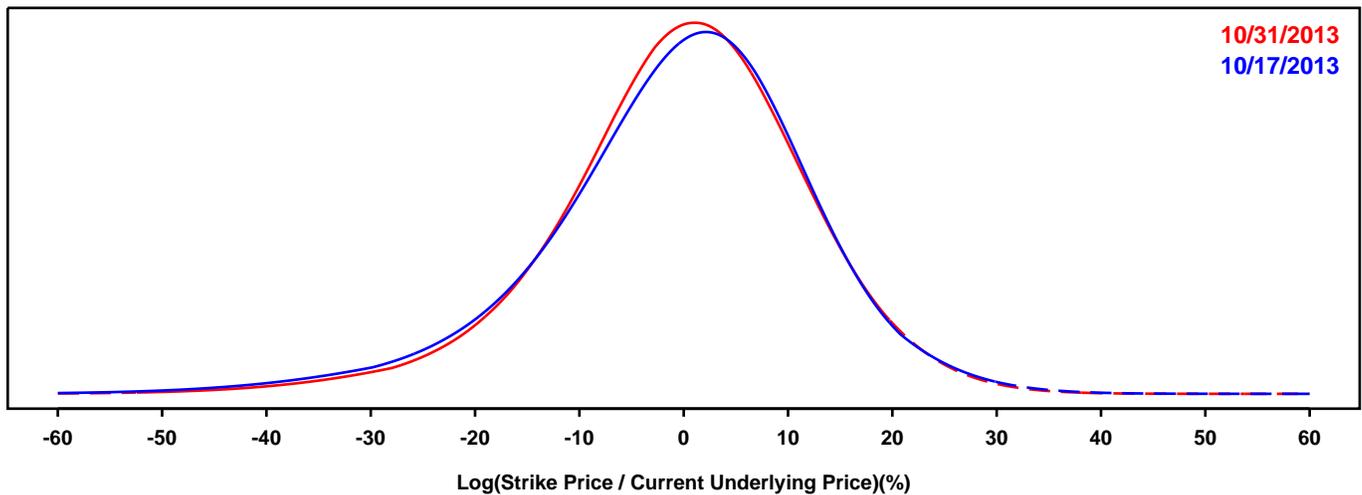
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- MORGAN STANLEY

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

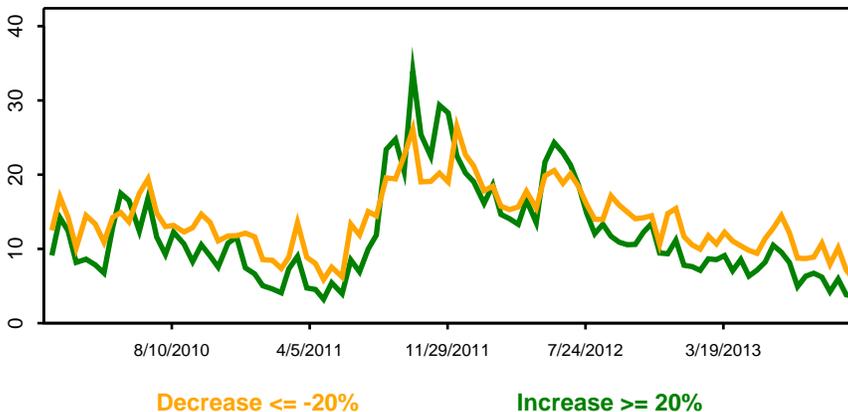
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

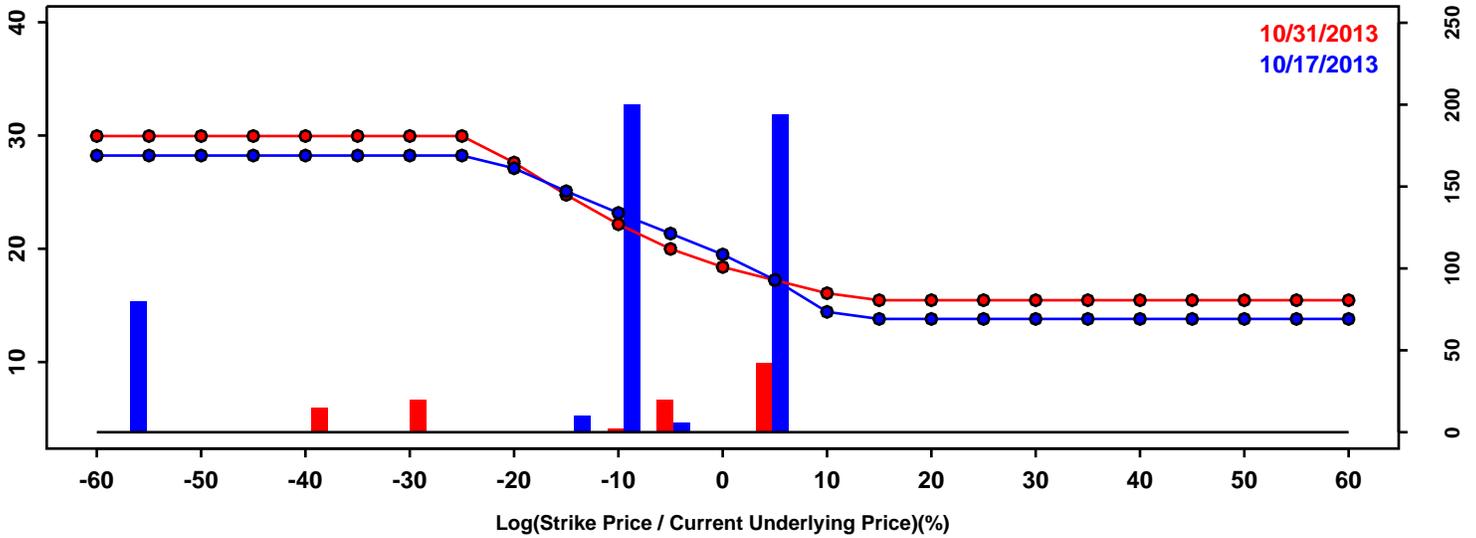


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-16.78%	-15.37%	1.41%
50th Pct	0.53%	0.39%	-0.15%
90th Pct	14.31%	14.25%	-0.07%
Mean	-0.54%	-0.25%	0.29%
Std Dev	12.91%	12.16%	-0.75%
Skew	-0.62	-0.49	0.13
Kurtosis	1.31	1.08	-0.23

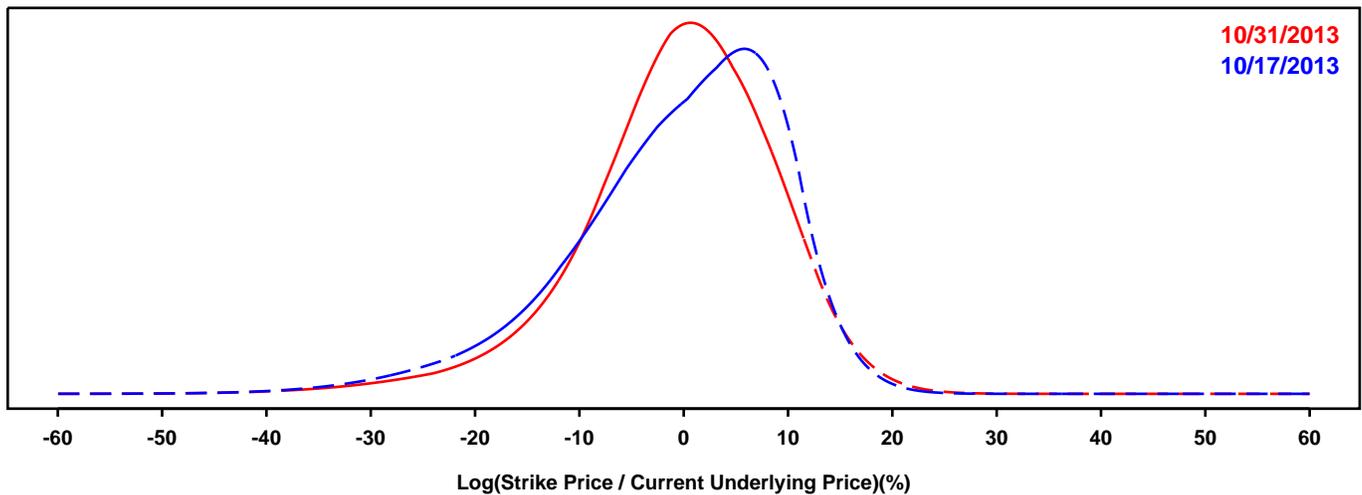
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- PNC FINANCIAL

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

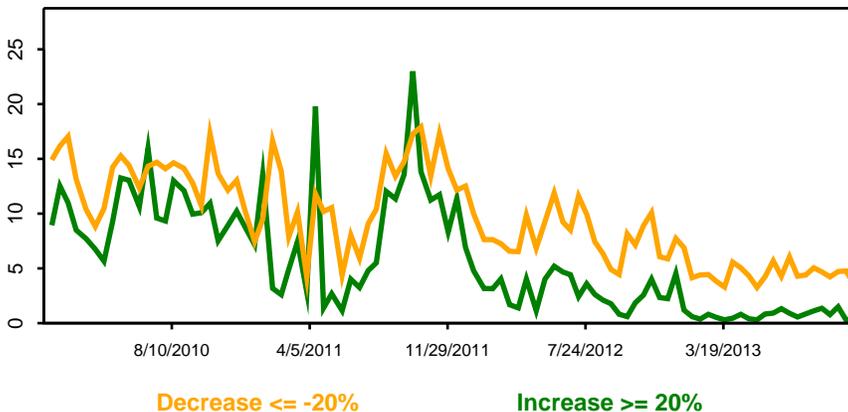
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

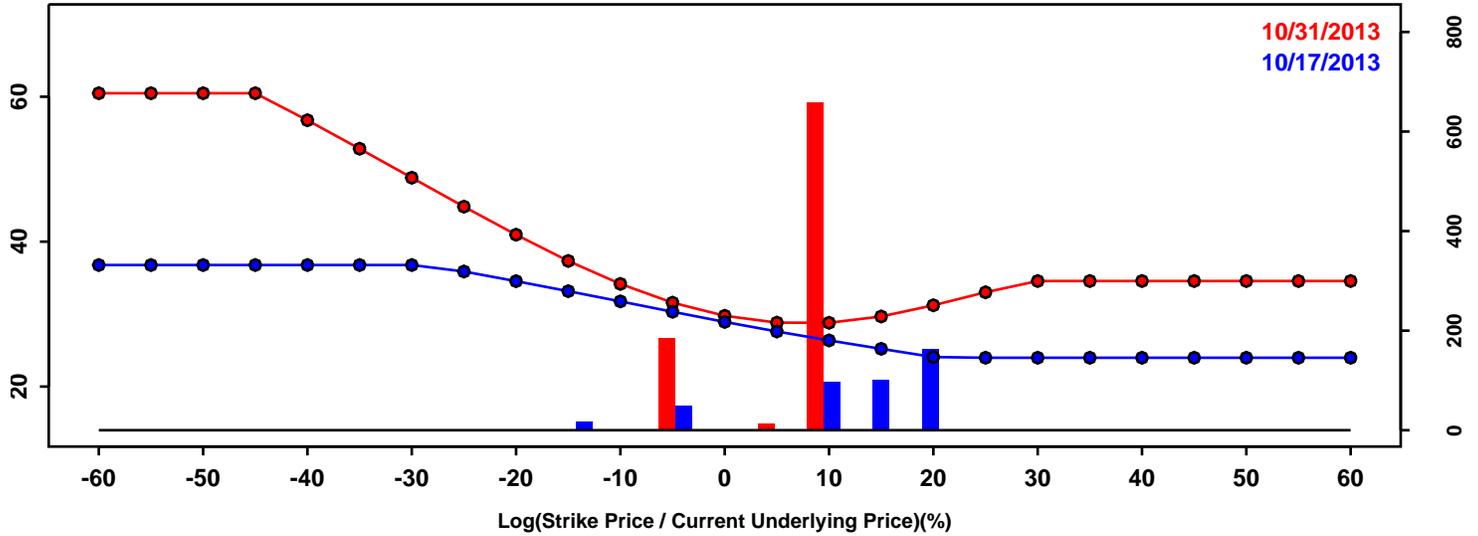


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-14.13%	-12.23%	1.91%
50th Pct	1.02%	0.20%	-0.82%
90th Pct	10.75%	10.44%	-0.32%
Mean	-0.54%	-0.54%	-0.00%
Std Dev	10.15%	9.42%	-0.73%
Skew	-0.85	-0.76	0.09
Kurtosis	0.96	1.55	0.59

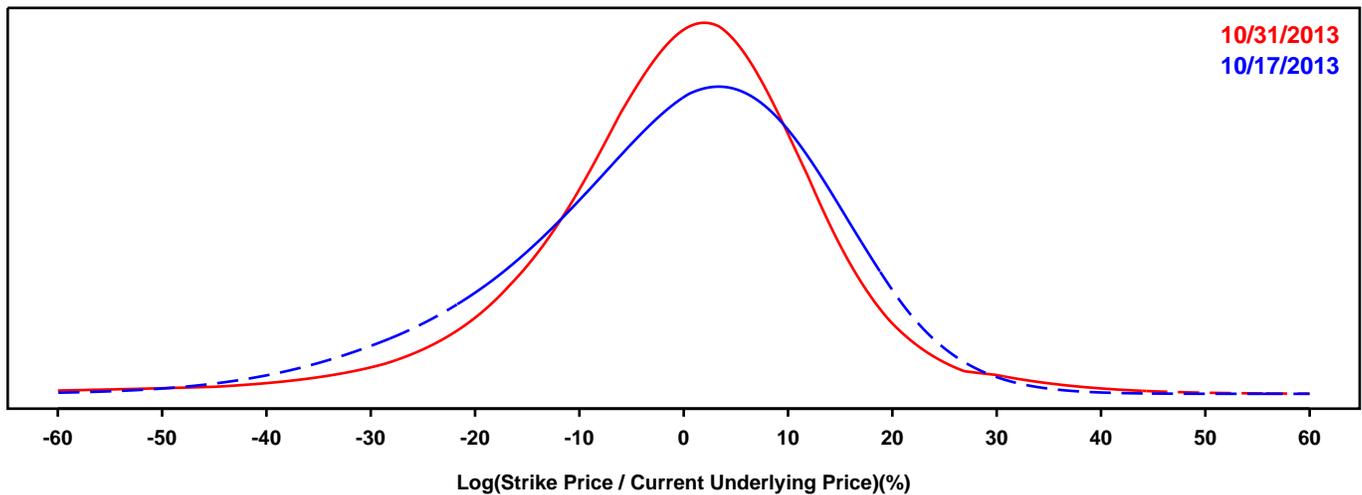
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- REGIONS FINANCIAL

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

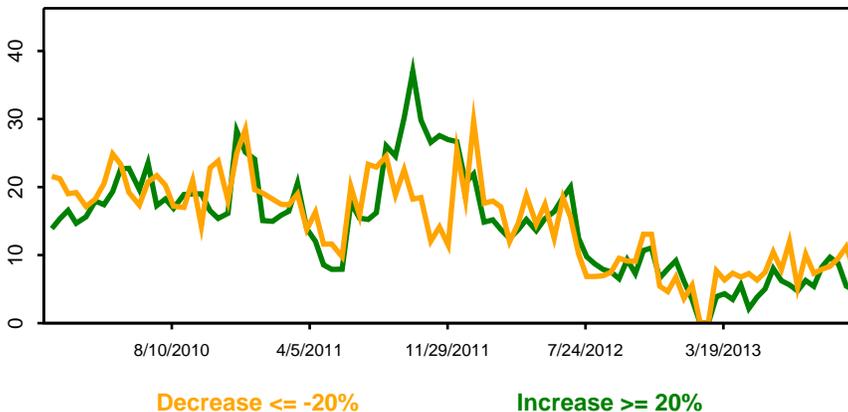
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

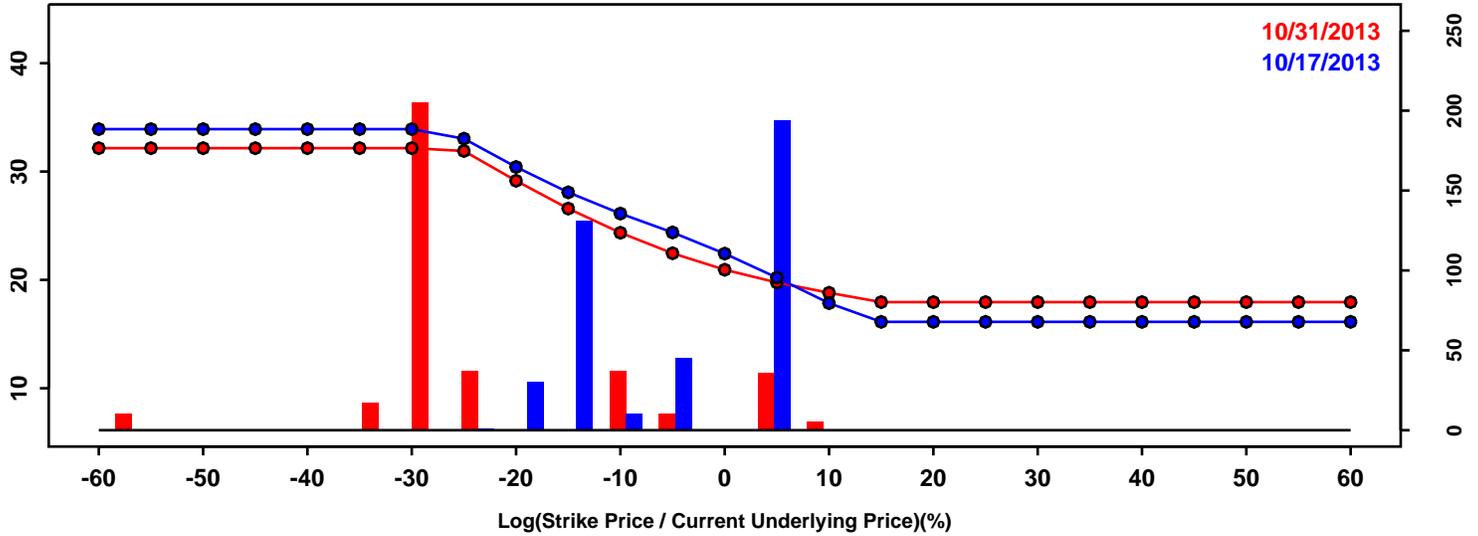


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-21.29%	-17.24%	4.05%
50th Pct	0.49%	0.48%	-0.01%
90th Pct	16.41%	14.86%	-1.55%
Mean	-1.13%	-0.64%	0.49%
Std Dev	14.94%	14.41%	-0.54%
Skew	-0.57	-0.91	-0.33
Kurtosis	0.48	3.75	3.27

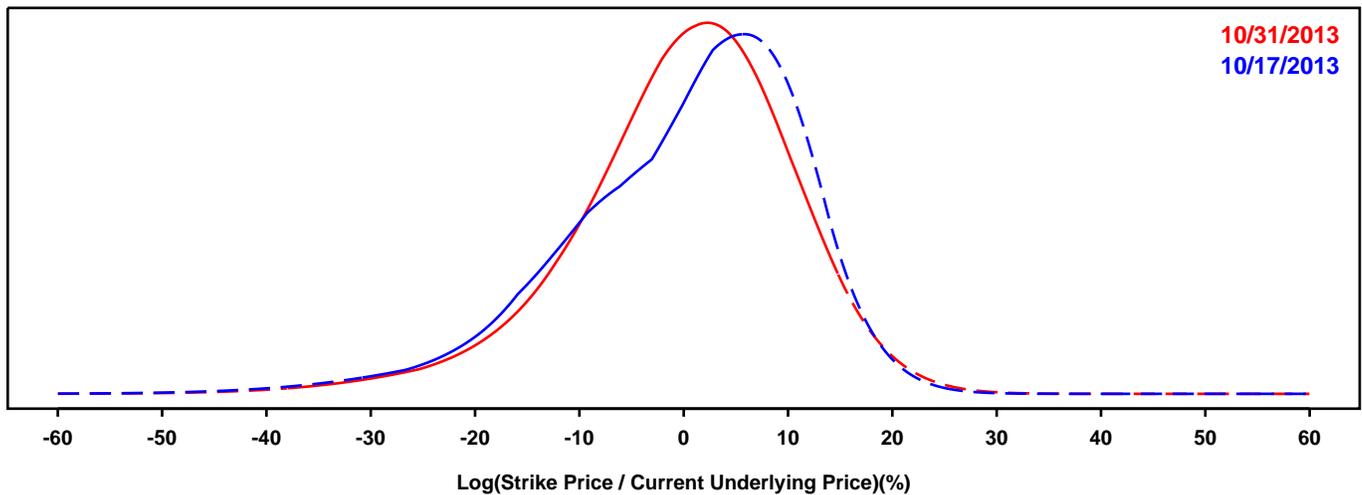
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- SUNTRUST

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

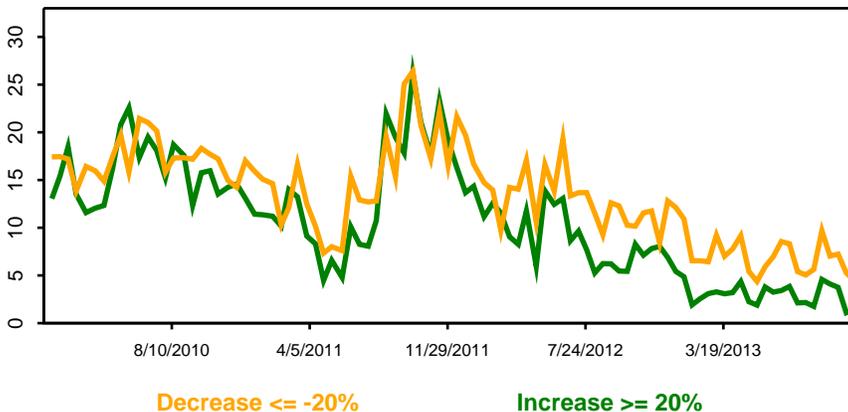
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

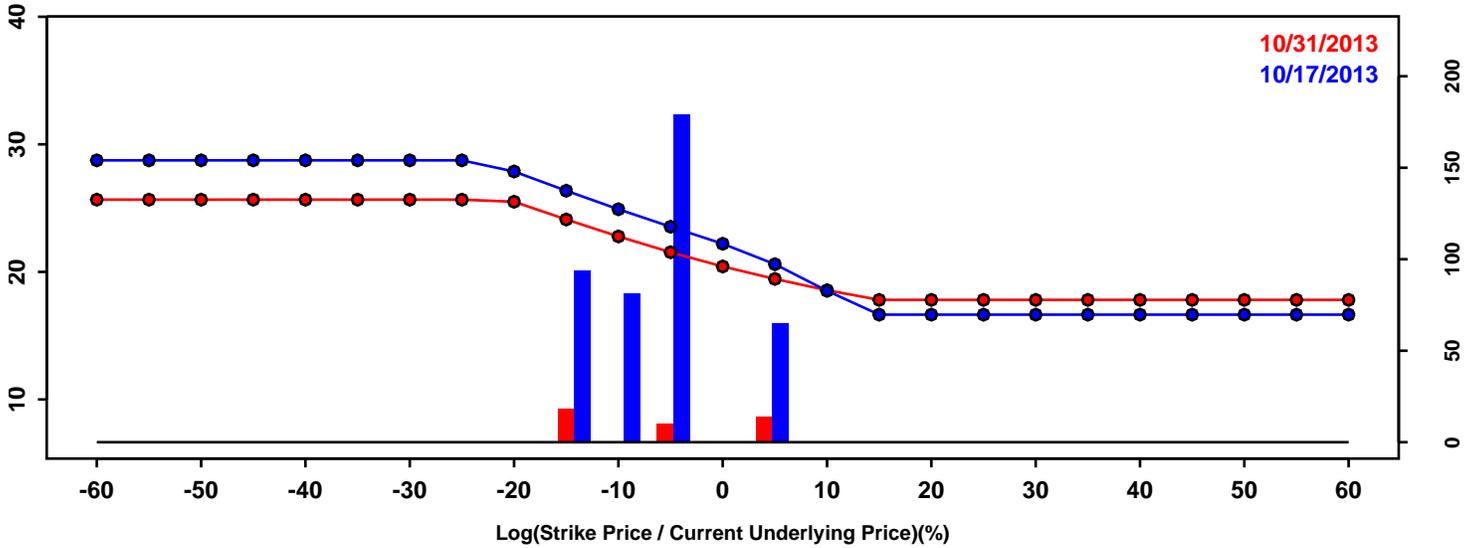


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-14.90%	-13.55%	1.34%
50th Pct	1.98%	0.86%	-1.12%
90th Pct	12.76%	12.29%	-0.47%
Mean	0.13%	-0.09%	-0.22%
Std Dev	11.32%	10.63%	-0.69%
Skew	-0.85	-0.69	0.16
Kurtosis	1.11	1.26	0.14

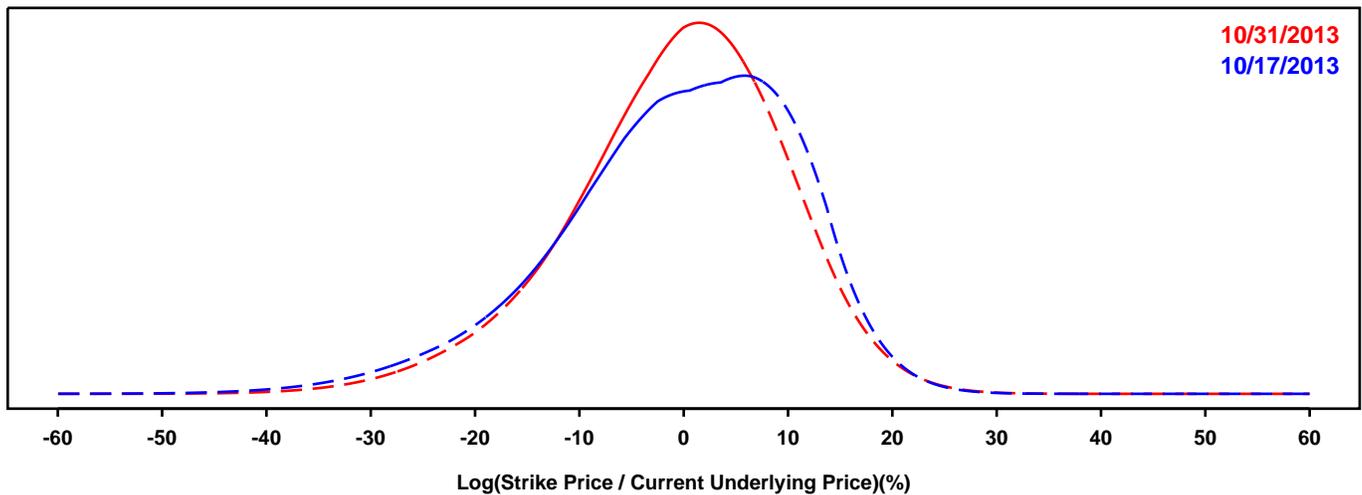
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- STATE STREET

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

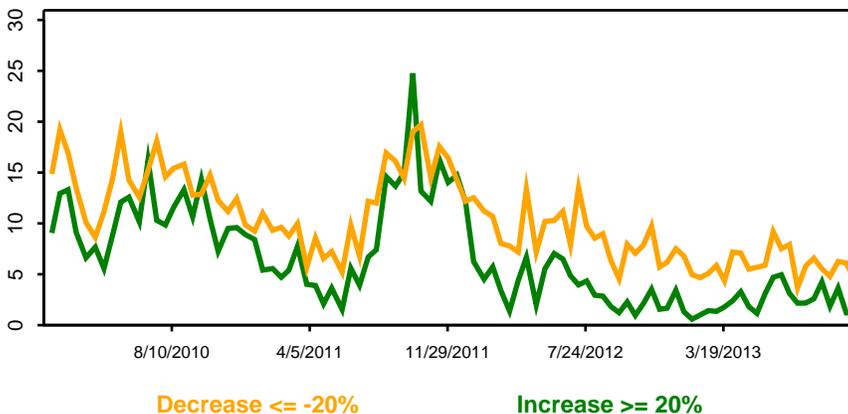
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

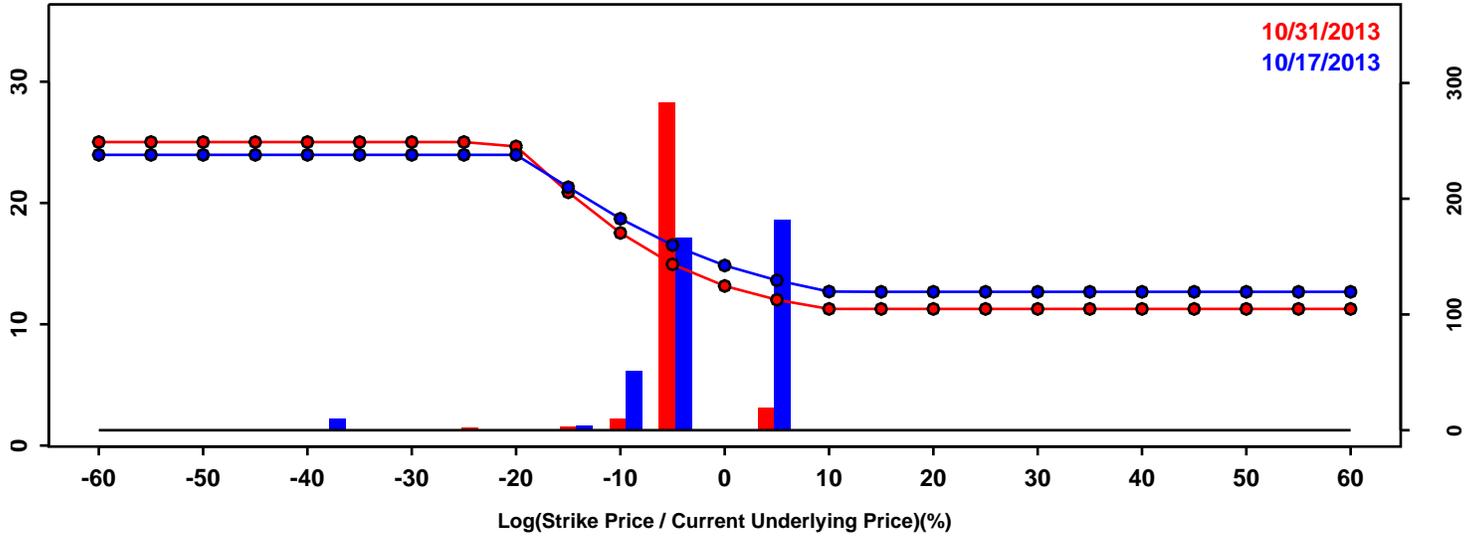


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-15.90%	-14.41%	1.49%
50th Pct	0.61%	0.12%	-0.48%
90th Pct	12.80%	11.75%	-1.05%
Mean	-0.60%	-0.70%	-0.10%
Std Dev	11.42%	10.41%	-1.02%
Skew	-0.62	-0.47	0.15
Kurtosis	0.44	0.45	0.00

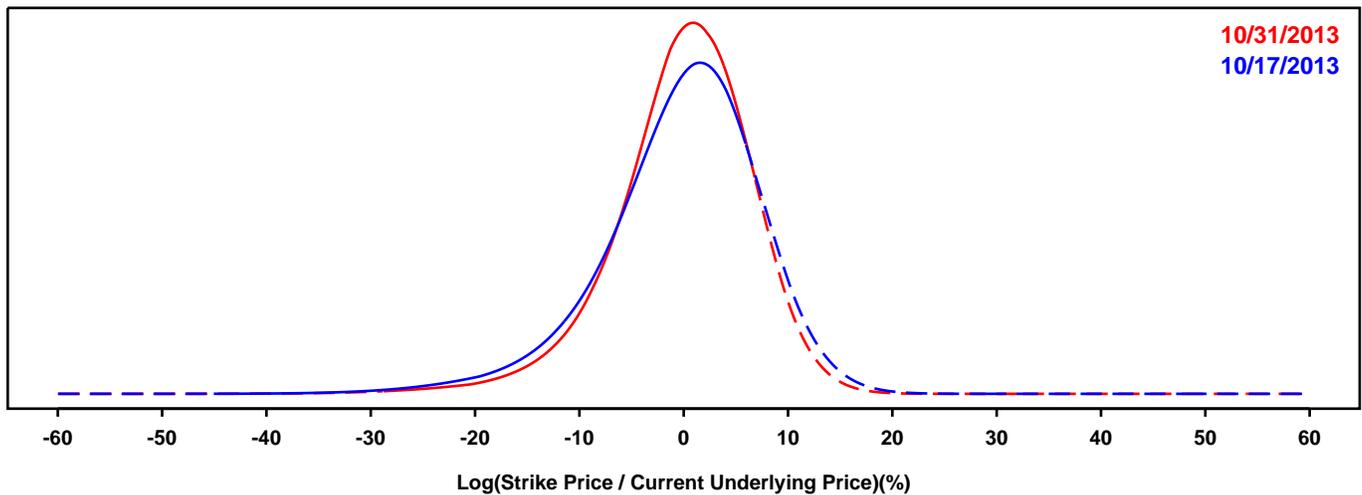
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- US BANCORP

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

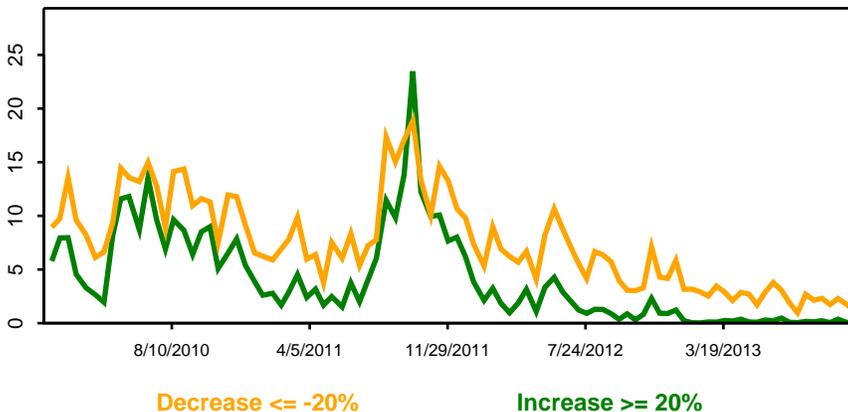
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

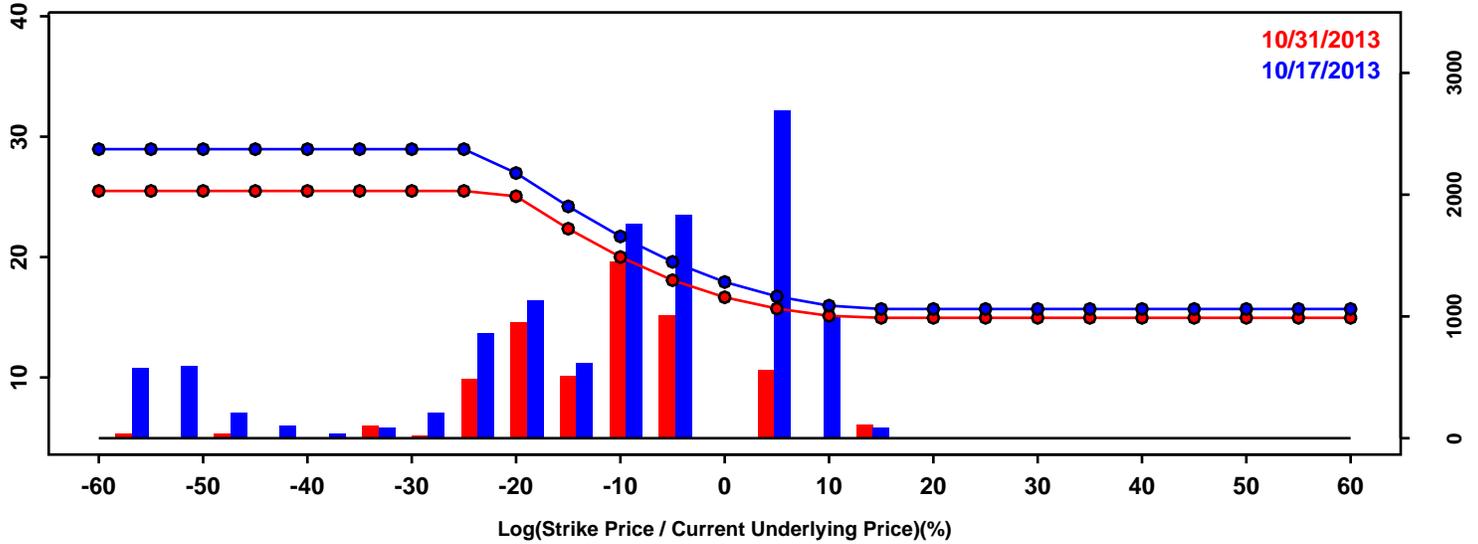


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-9.84%	-8.40%	1.44%
50th Pct	0.53%	0.42%	-0.11%
90th Pct	8.50%	7.62%	-0.87%
Mean	-0.22%	-0.11%	0.11%
Std Dev	7.59%	6.72%	-0.87%
Skew	-0.75	-0.83	-0.08
Kurtosis	1.45	2.08	0.63

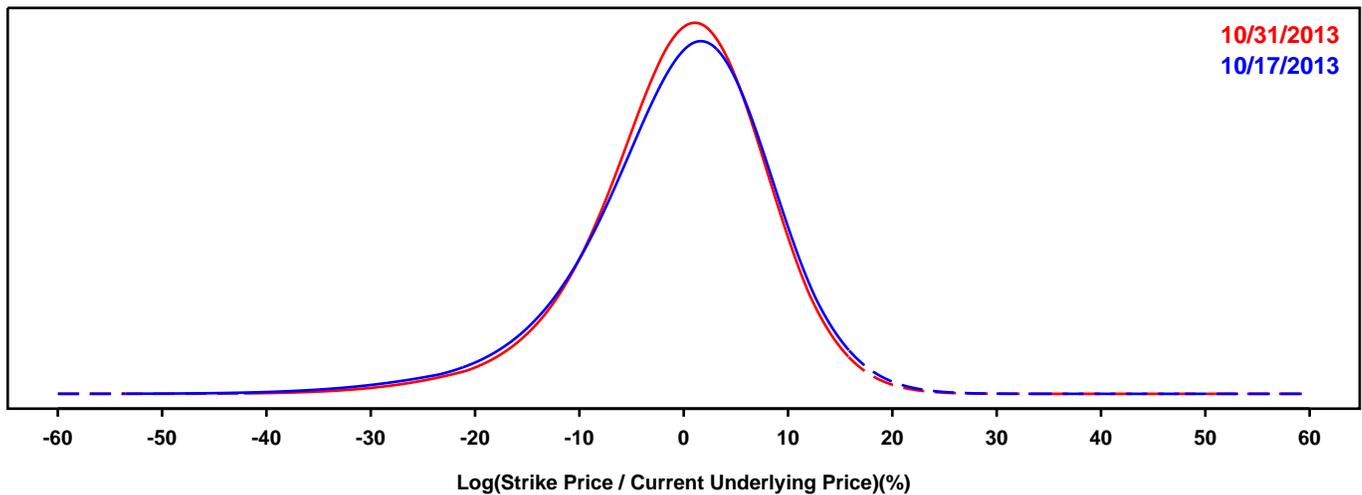
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- WELLS FARGO

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

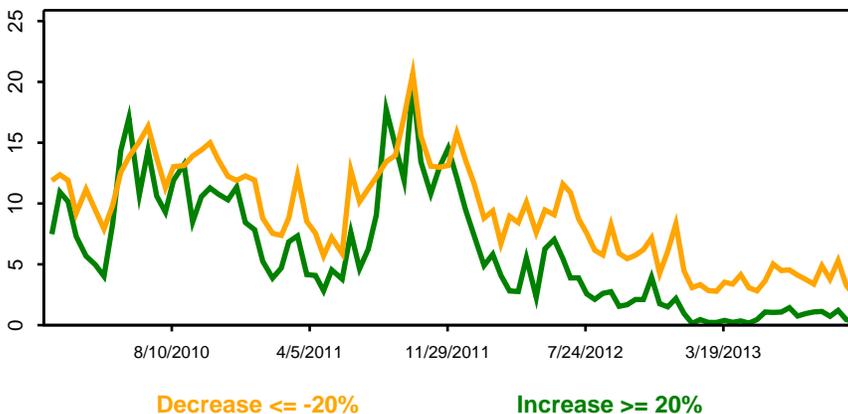
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

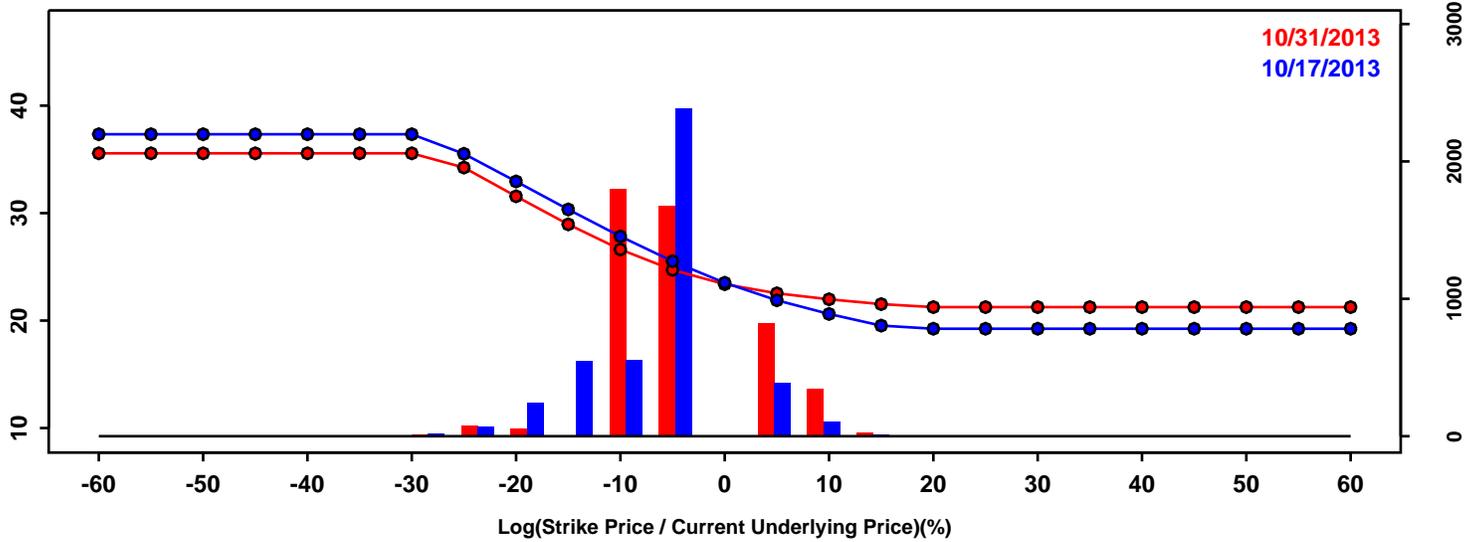


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-12.10%	-11.13%	0.97%
50th Pct	0.36%	0.19%	-0.16%
90th Pct	9.94%	9.43%	-0.52%
Mean	-0.53%	-0.45%	0.08%
Std Dev	9.17%	8.46%	-0.71%
Skew	-0.76	-0.62	0.13
Kurtosis	1.53	1.21	-0.33

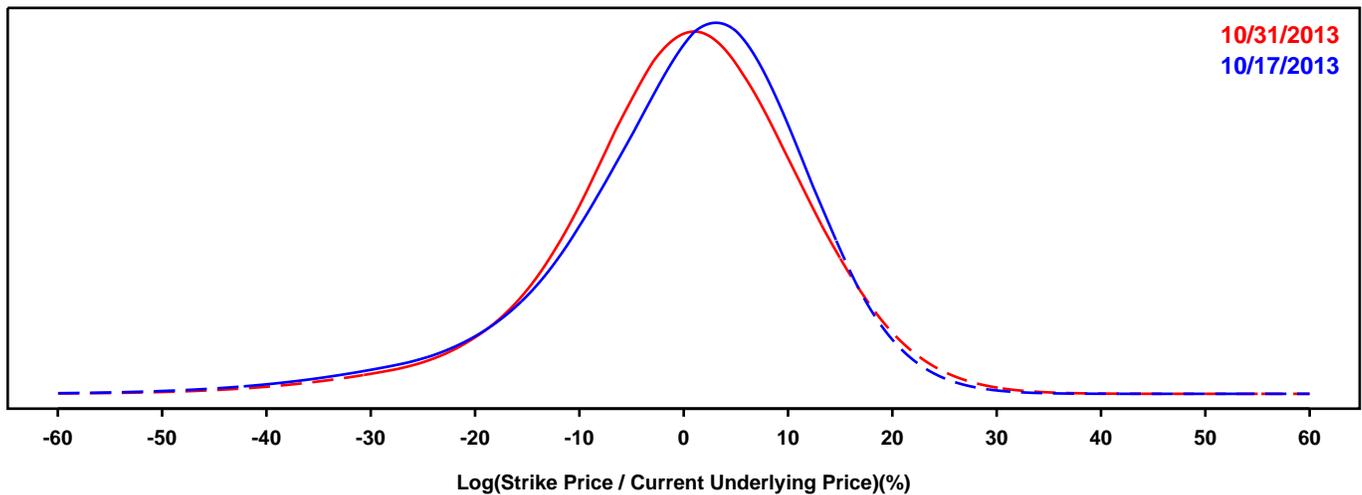
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- AIG

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

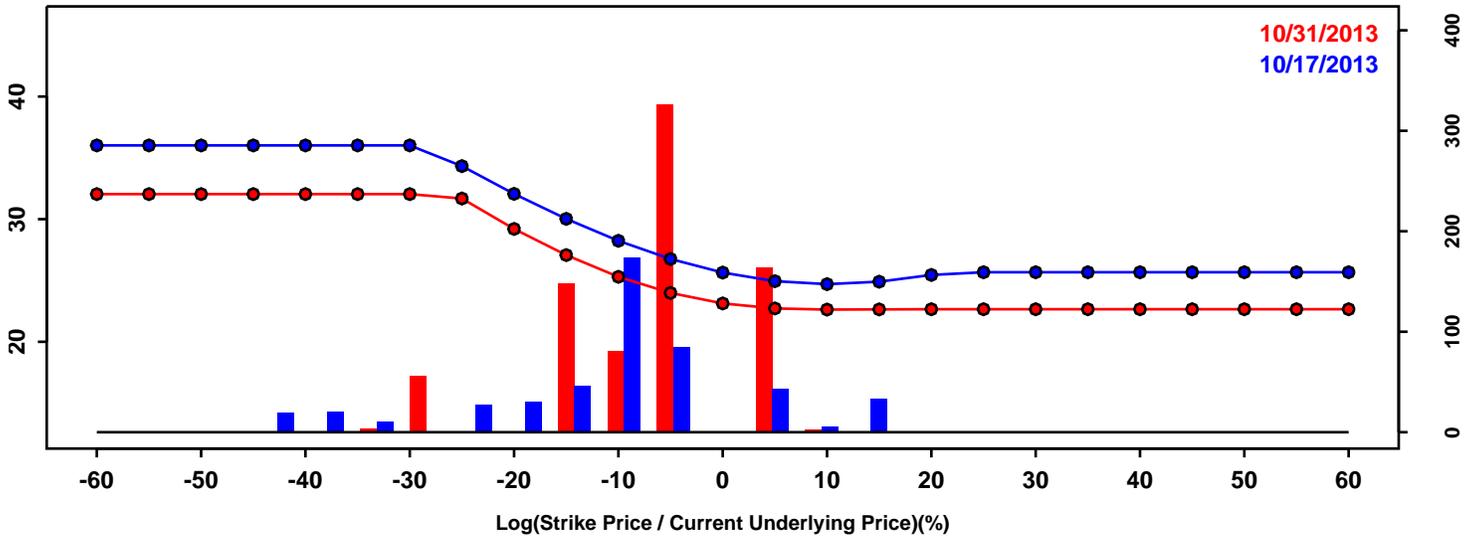


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-15.49%	-14.70%	0.79%
50th Pct	1.28%	0.52%	-0.76%
90th Pct	13.42%	13.77%	0.35%
Mean	-0.19%	-0.21%	-0.02%
Std Dev	12.13%	11.81%	-0.33%
Skew	-0.91	-0.61	0.30
Kurtosis	1.74	1.35	-0.39

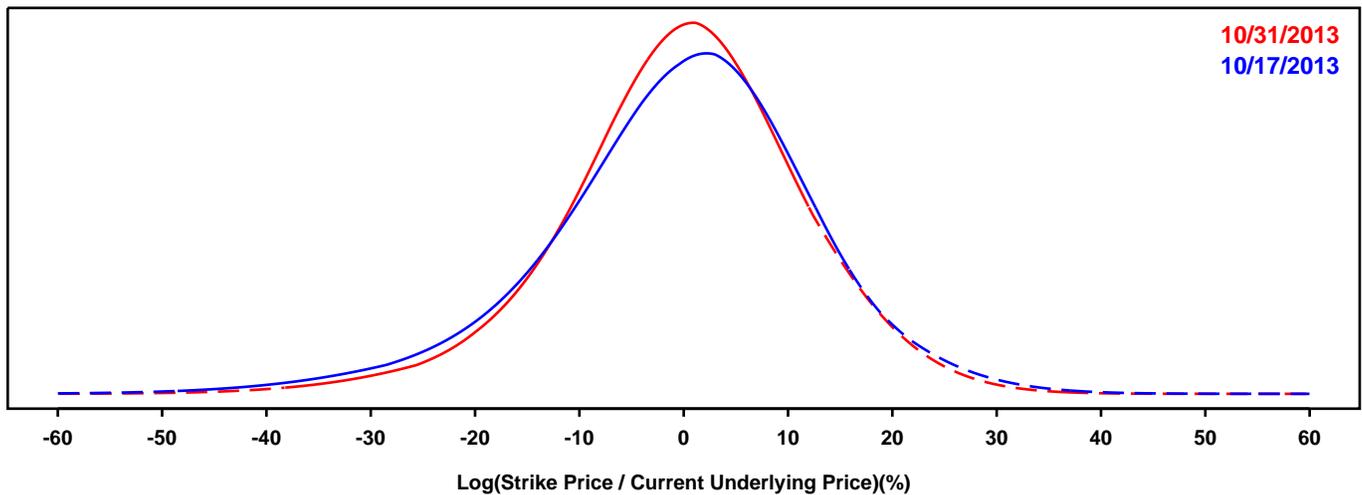
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- HARTFORD FINANCIAL

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

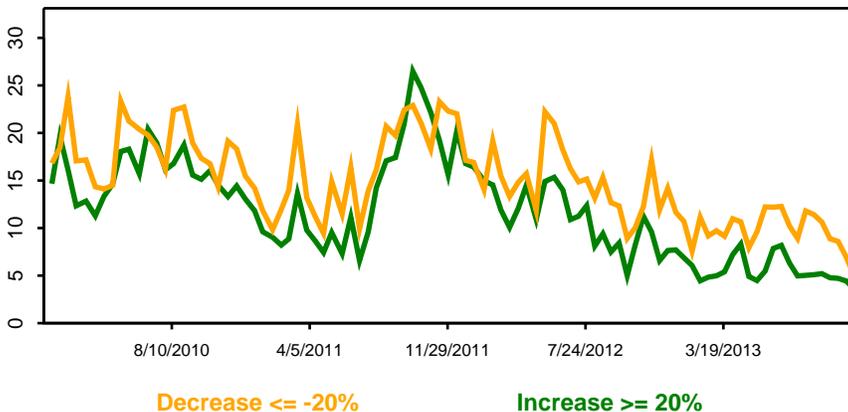
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

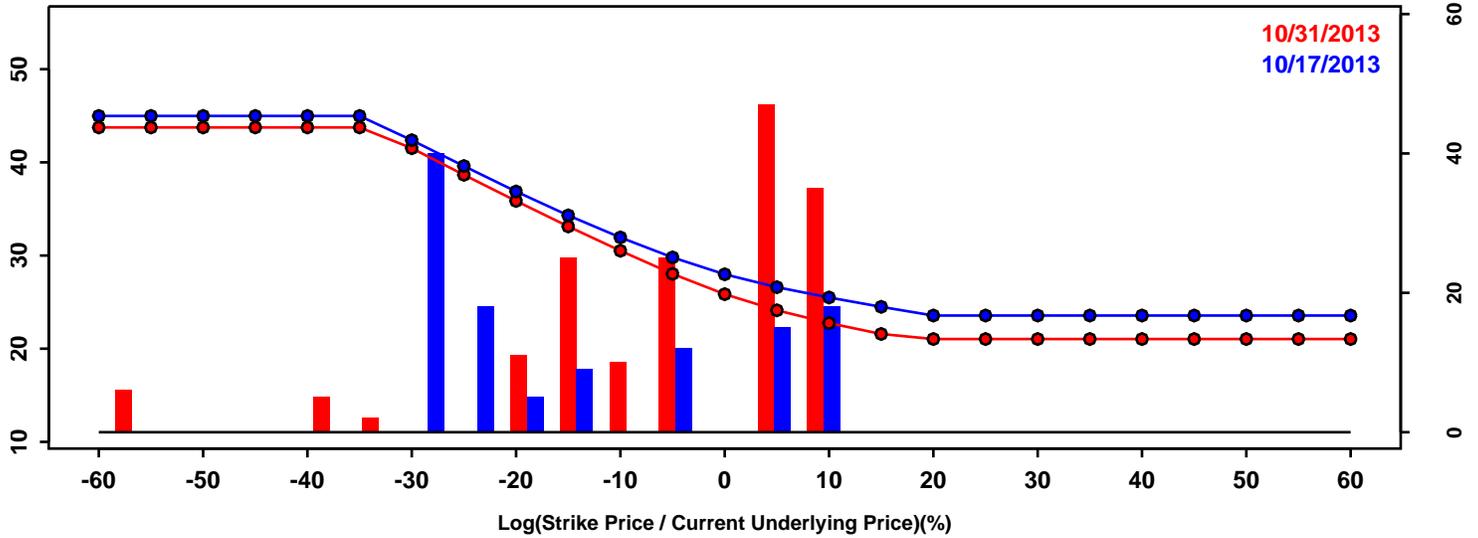


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-16.60%	-14.49%	2.11%
50th Pct	0.53%	0.30%	-0.23%
90th Pct	14.80%	14.09%	-0.71%
Mean	-0.33%	-0.07%	0.26%
Std Dev	12.91%	11.61%	-1.31%
Skew	-0.46	-0.34	0.12
Kurtosis	1.01	0.82	-0.18

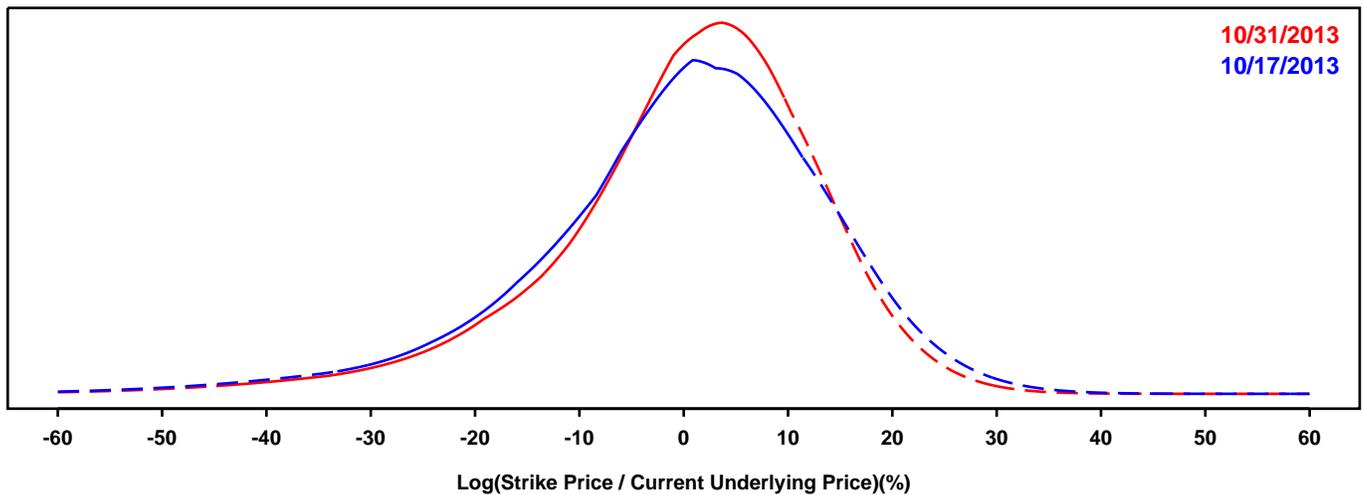
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- LINCOLN NATIONAL

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

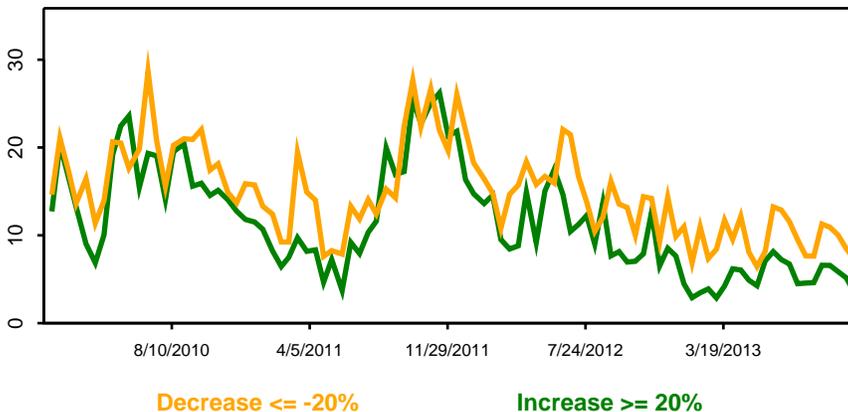
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

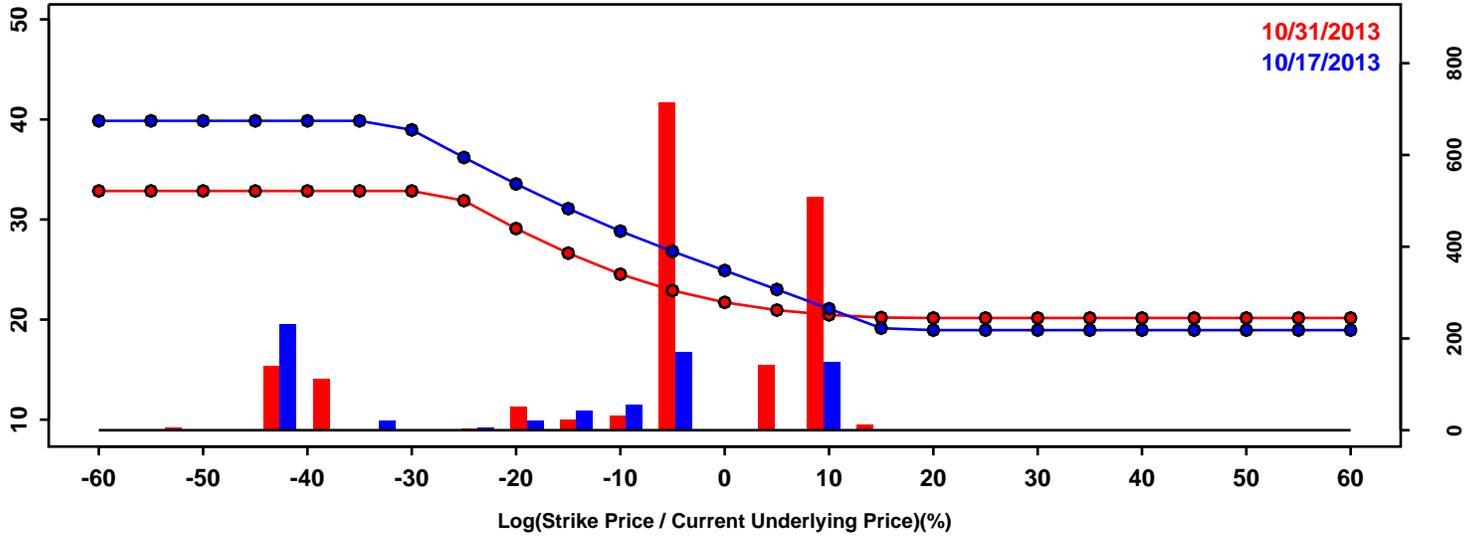


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-18.15%	-16.60%	1.56%
50th Pct	1.15%	1.72%	0.57%
90th Pct	16.15%	14.79%	-1.35%
Mean	-0.23%	0.13%	0.36%
Std Dev	14.28%	13.17%	-1.12%
Skew	-0.82	-0.96	-0.15
Kurtosis	1.66	2.05	0.39

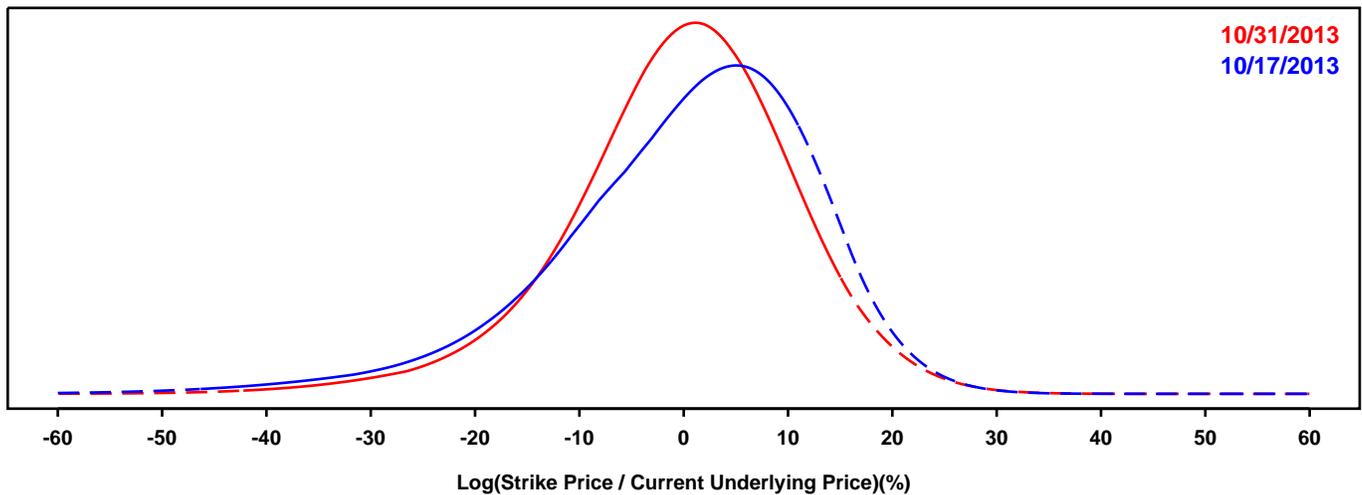
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- METLIFE

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

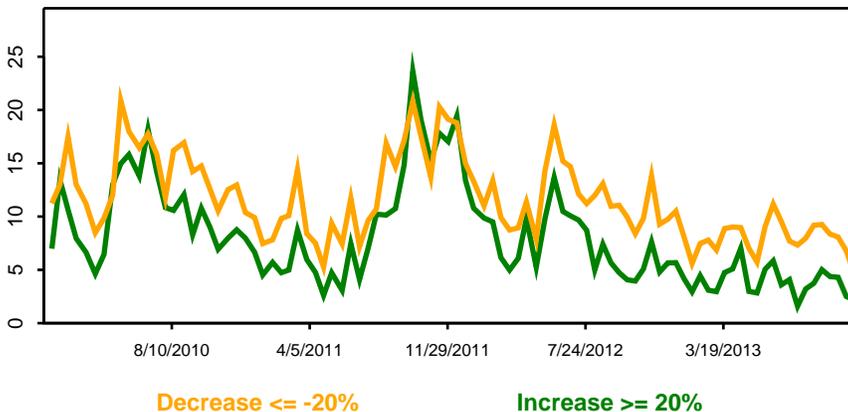
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

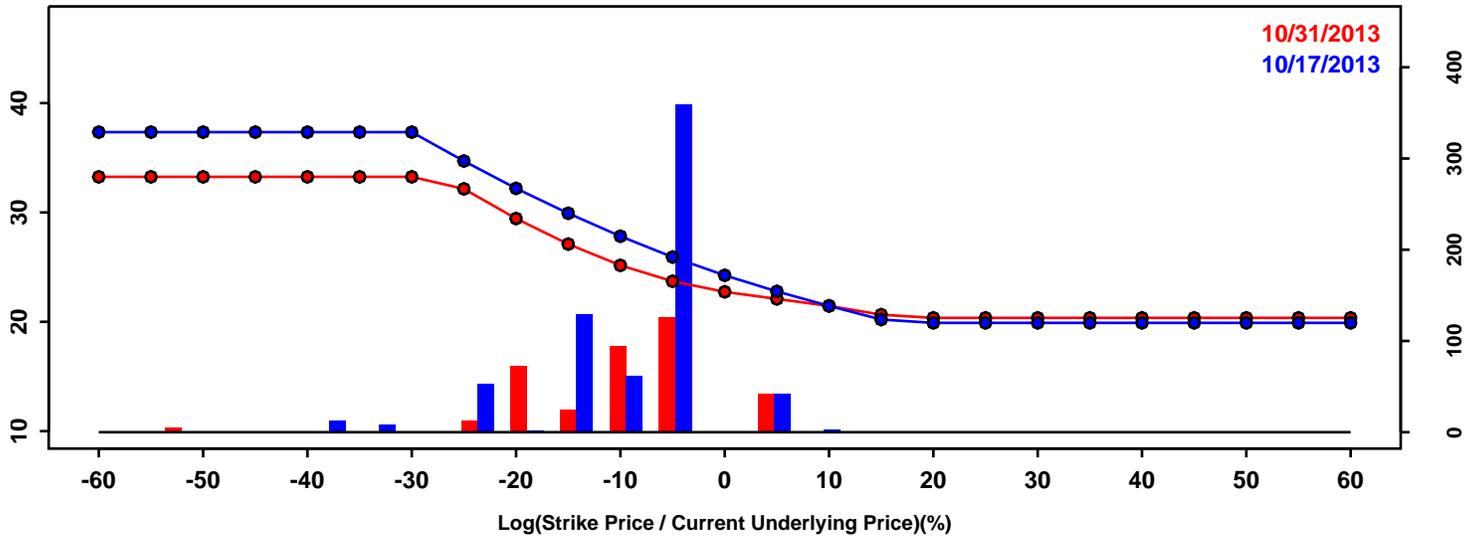


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-16.23%	-14.03%	2.21%
50th Pct	1.74%	0.36%	-1.38%
90th Pct	14.23%	12.69%	-1.54%
Mean	0.05%	-0.31%	-0.36%
Std Dev	12.65%	10.96%	-1.69%
Skew	-0.89	-0.54	0.35
Kurtosis	1.51	1.12	-0.39

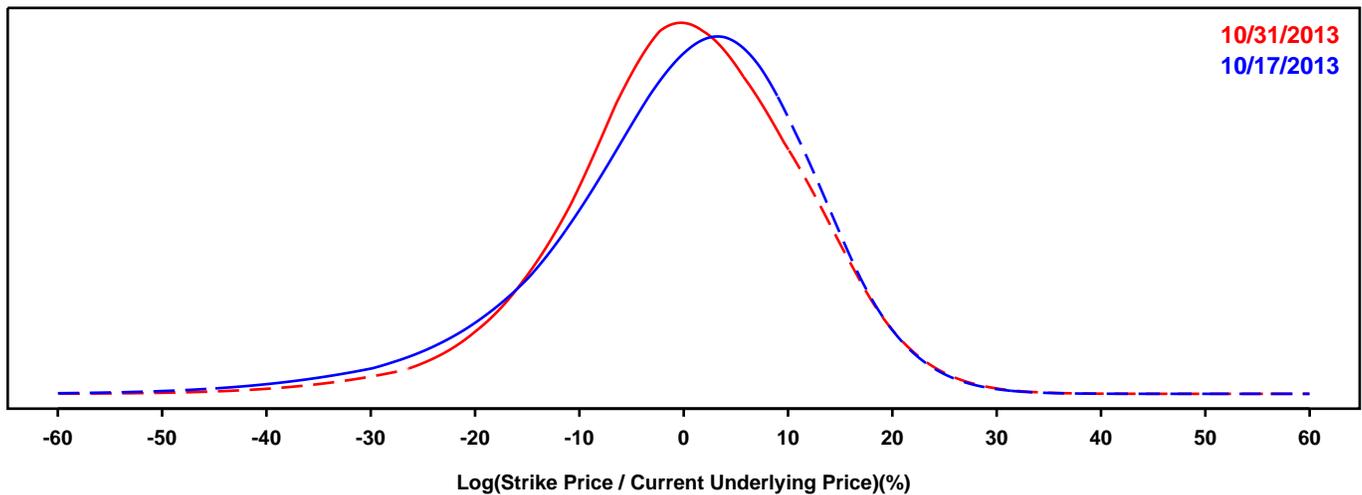
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- PRUDENTIAL

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

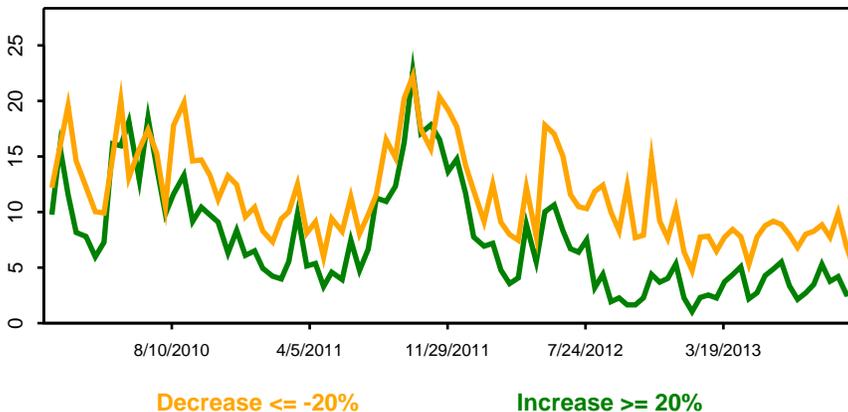
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

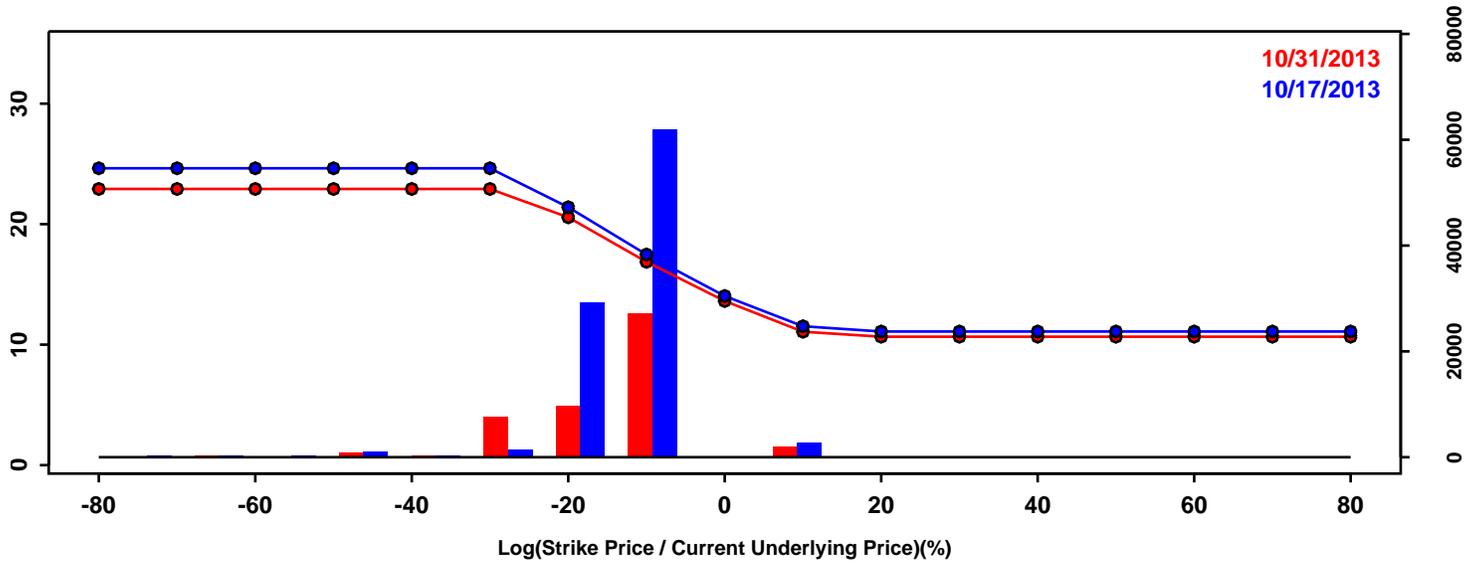


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-16.48%	-14.42%	2.05%
50th Pct	1.01%	0.24%	-0.77%
90th Pct	13.90%	13.82%	-0.08%
Mean	-0.36%	-0.15%	0.21%
Std Dev	12.48%	11.41%	-1.06%
Skew	-0.77	-0.45	0.32
Kurtosis	1.27	0.86	-0.41

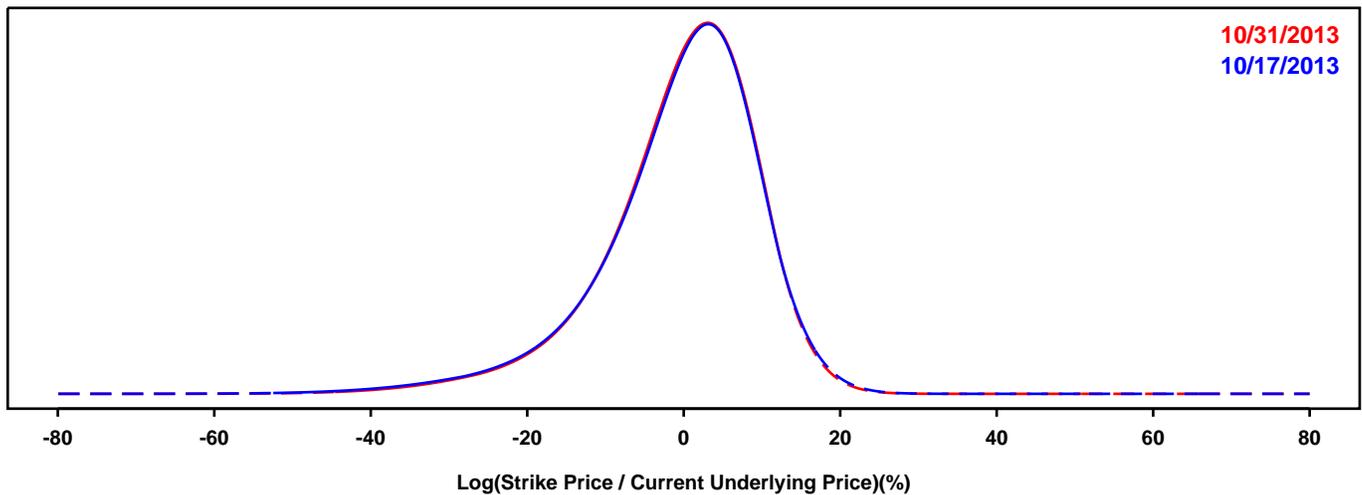
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- S&P 500

Log returns are based on the risk neutral density function of the underlying asset derived from options that expire in approximately 6 months.

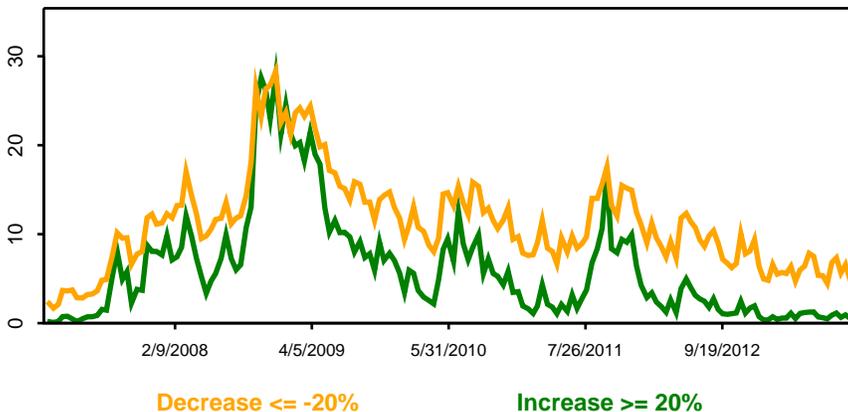
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

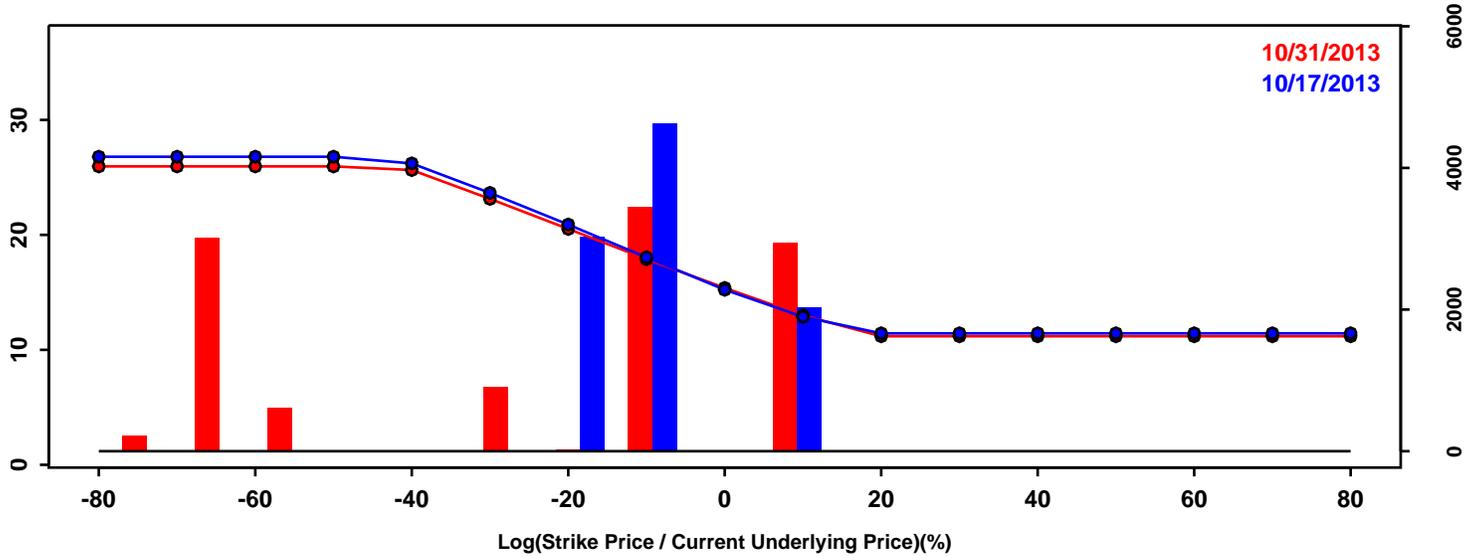


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-13.60%	-13.07%	0.53%
50th Pct	1.01%	1.00%	-0.00%
90th Pct	10.69%	10.57%	-0.12%
Mean	-0.50%	-0.37%	0.13%
Std Dev	10.33%	9.95%	-0.38%
Skew	-1.08	-1.00	0.08
Kurtosis	2.27	1.95	-0.32

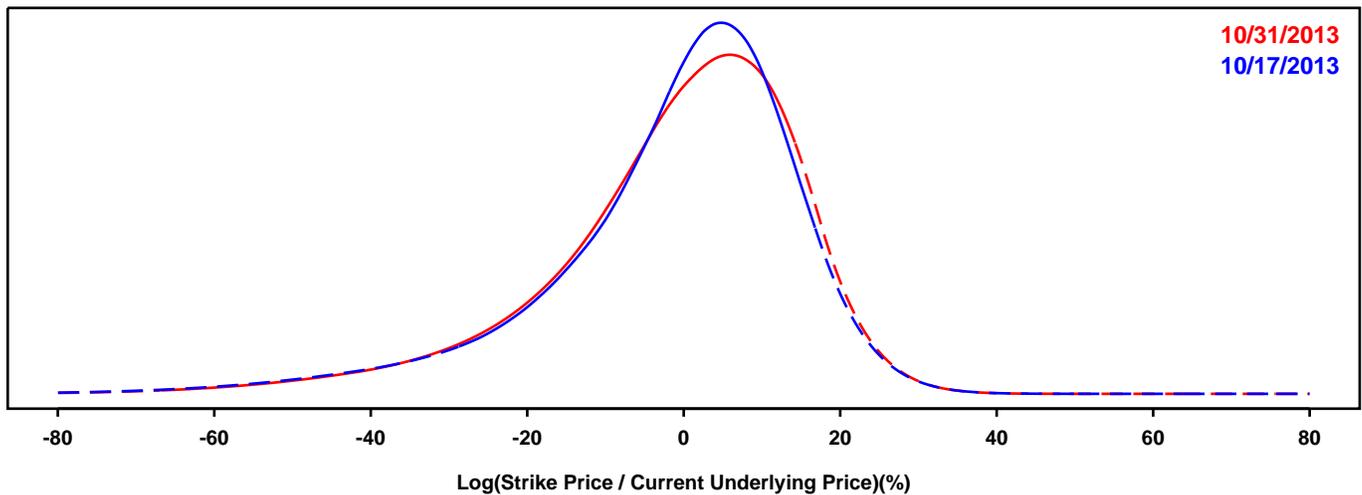
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- S&P 500

Log returns are based on the risk neutral density function of the underlying asset derived from options that expire in approximately 12 months.

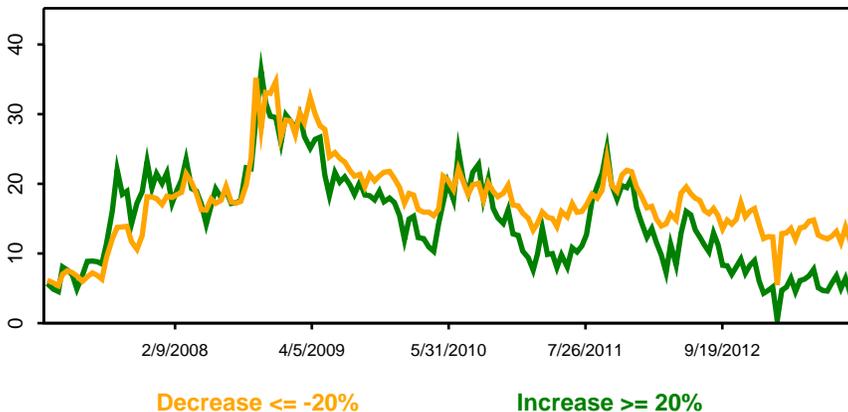
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

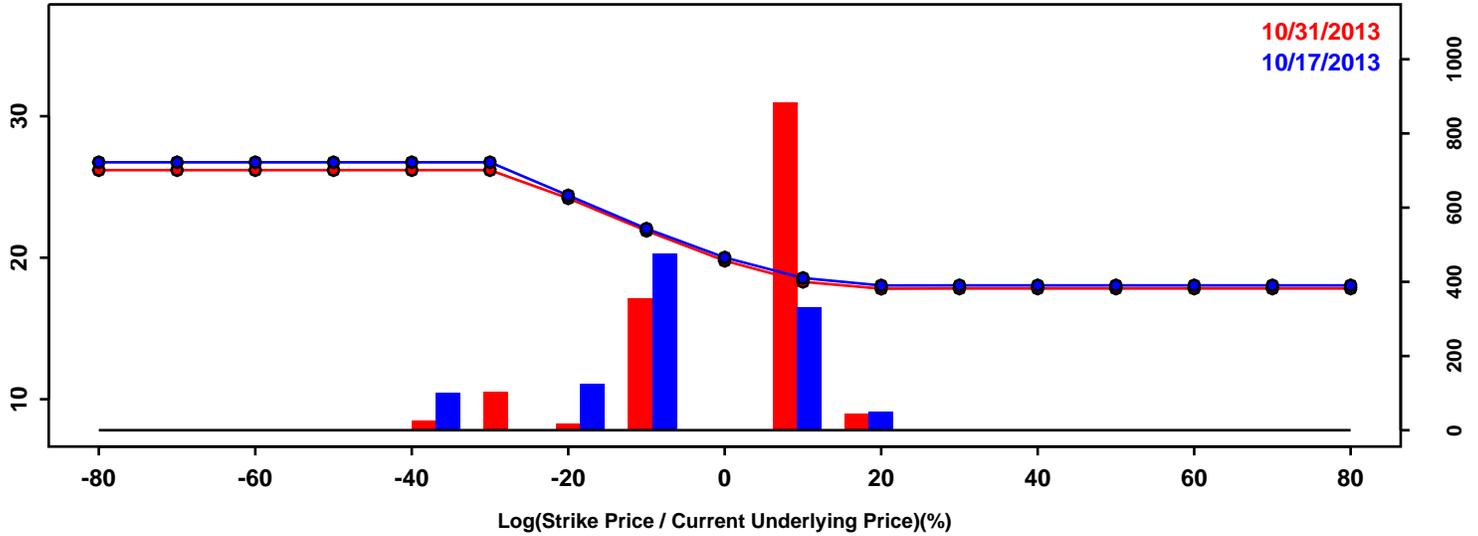


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-22.56%	-22.54%	0.02%
50th Pct	1.57%	1.51%	-0.06%
90th Pct	15.61%	16.21%	0.60%
Mean	-1.44%	-1.23%	0.21%
Std Dev	16.39%	16.34%	-0.05%
Skew	-1.25	-1.13	0.12
Kurtosis	2.53	2.07	-0.46

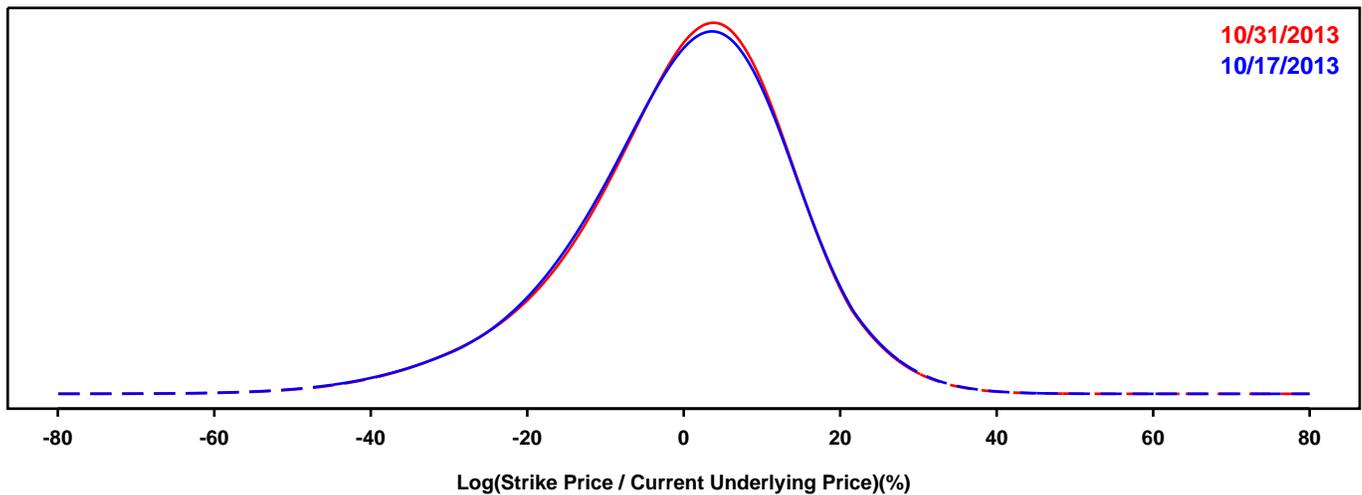
### RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- CRUDE OIL FUTURES (WTI)

Log returns are based on the risk neutral density function of the underlying asset derived from options that expire in approximately 6 months.

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



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

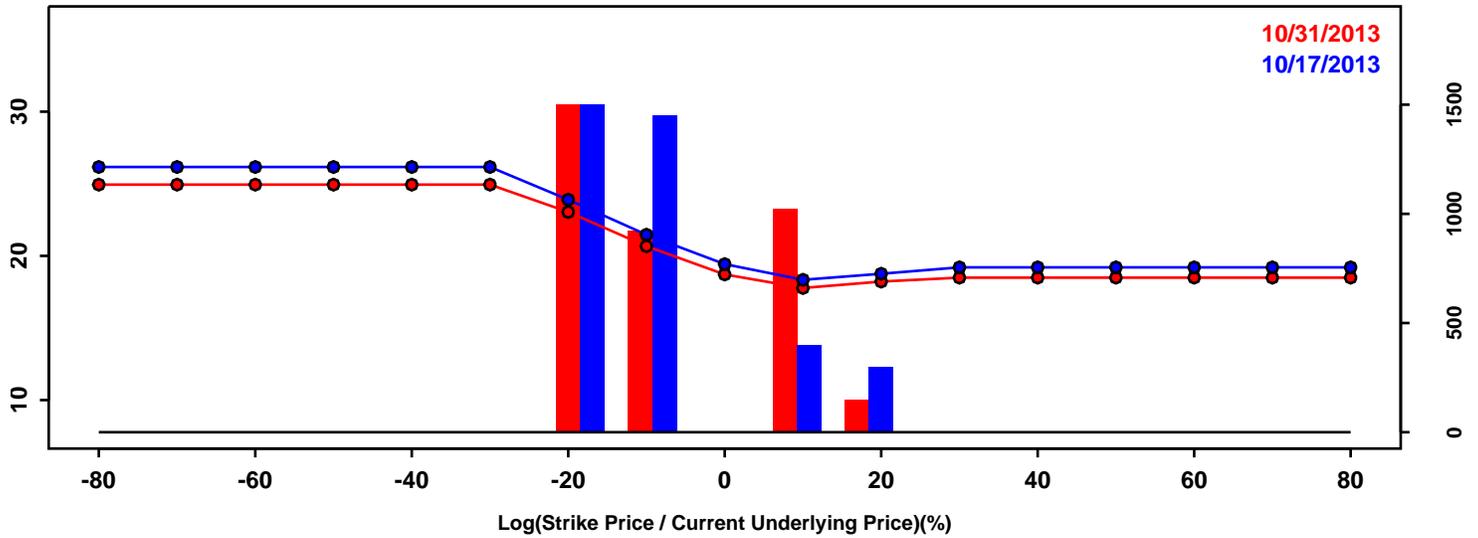


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-18.89%	-18.67%	0.22%
50th Pct	1.17%	1.38%	0.21%
90th Pct	16.40%	16.28%	-0.13%
Mean	-0.18%	-0.05%	0.13%
Std Dev	14.29%	14.12%	-0.16%
Skew	-0.57	-0.58	-0.01
Kurtosis	0.79	0.79	-0.00

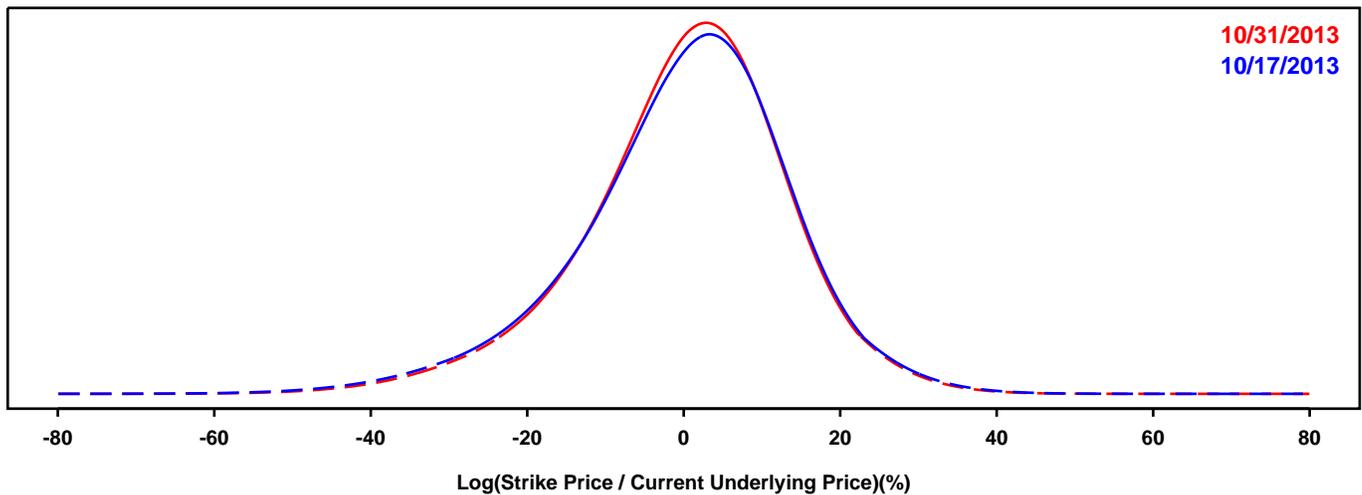
### RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- CRUDE OIL FUTURES (Brent)

Log returns are based on the risk neutral density function of the underlying asset derived from options that expire in approximately 6 months.

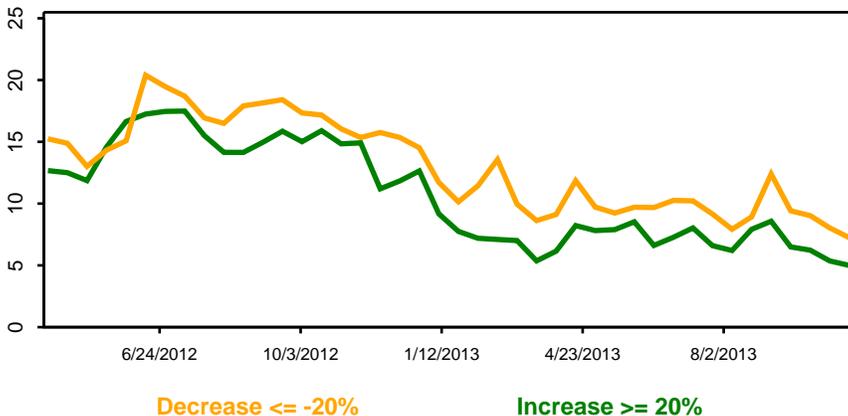
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

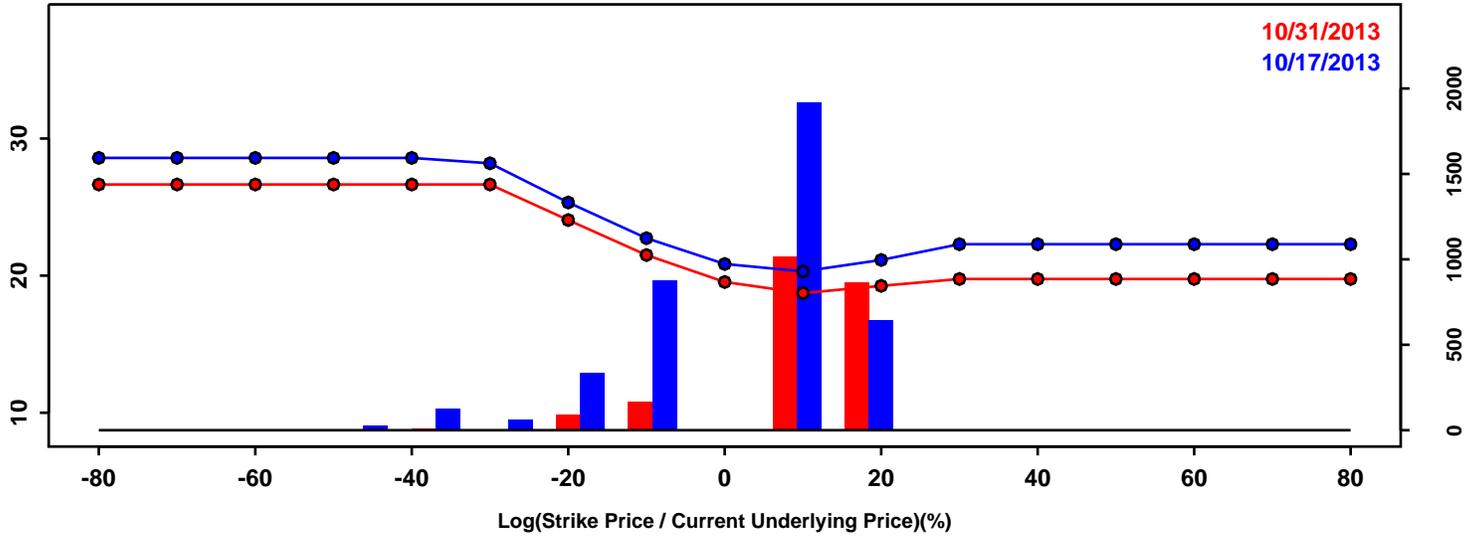


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-17.73%	-16.86%	0.87%
50th Pct	1.29%	1.26%	-0.04%
90th Pct	15.95%	15.57%	-0.38%
Mean	0.10%	0.21%	0.11%
Std Dev	13.78%	13.23%	-0.55%
Skew	-0.52	-0.48	0.04
Kurtosis	0.93	0.89	-0.04

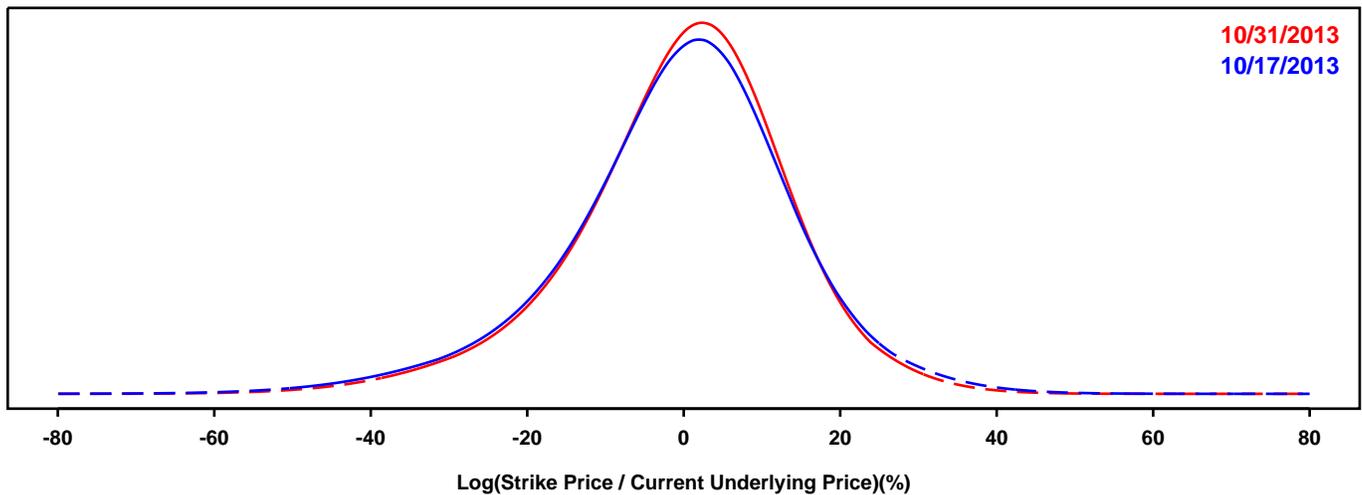
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- GOLD FUTURES

Log returns are based on the risk neutral density function of the underlying asset derived from options that expire in approximately 6 months.

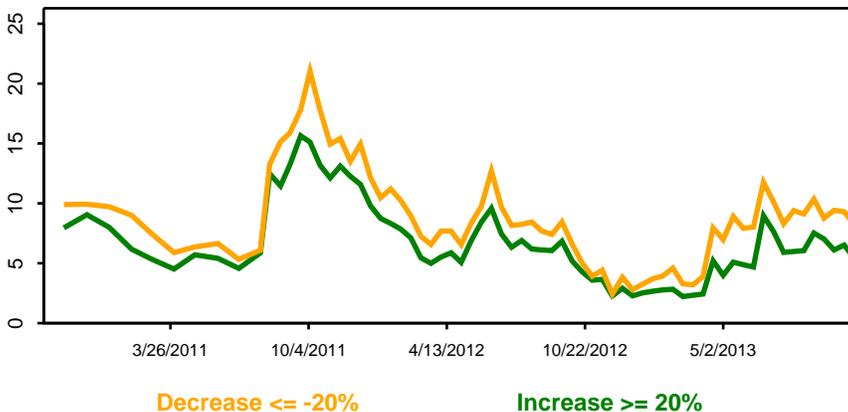
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

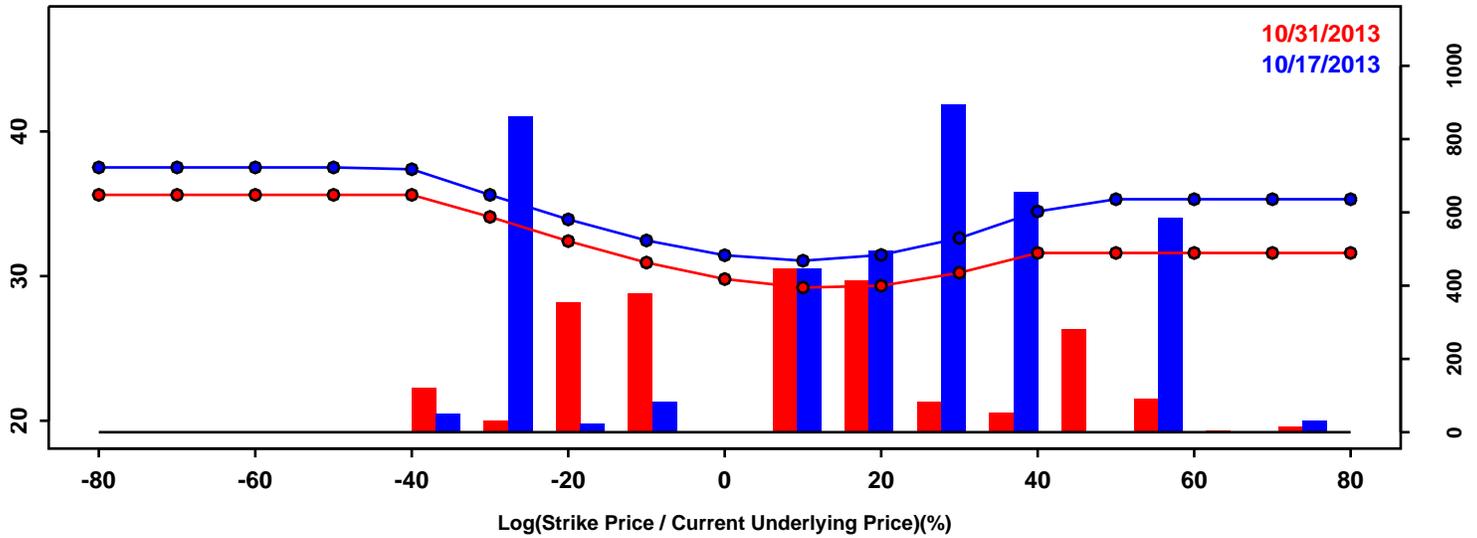


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-19.20%	-17.97%	1.23%
50th Pct	0.52%	0.79%	0.27%
90th Pct	16.71%	15.85%	-0.85%
Mean	-0.48%	-0.24%	0.23%
Std Dev	14.83%	13.89%	-0.94%
Skew	-0.45	-0.49	-0.04
Kurtosis	1.09	0.99	-0.09

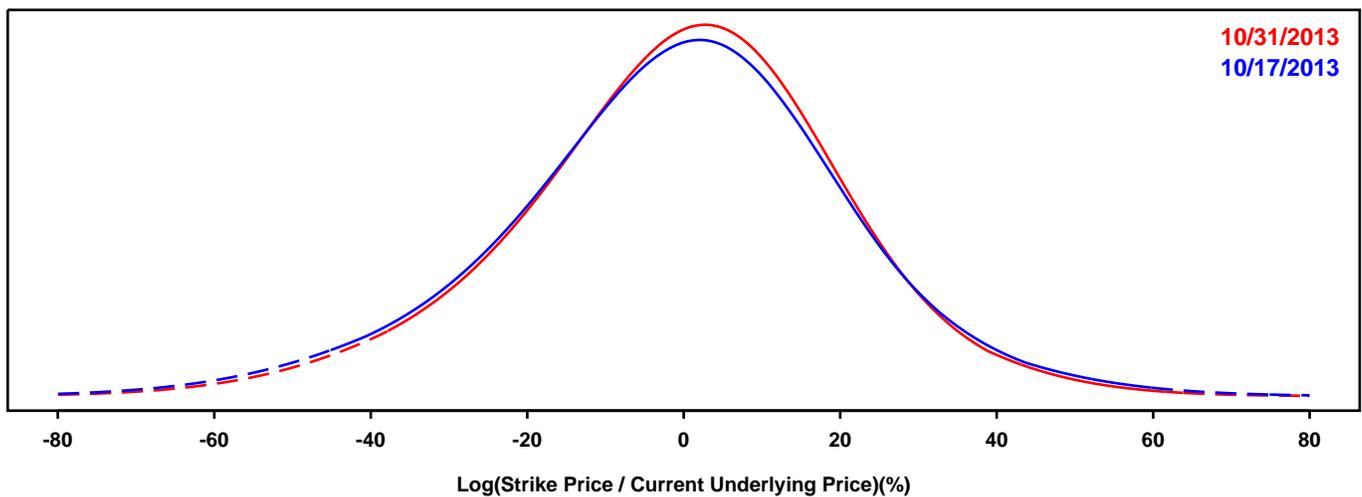
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- SILVER FUTURES

Log returns are based on the risk neutral density function of the underlying asset derived from options that expire in approximately 6 months.

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



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

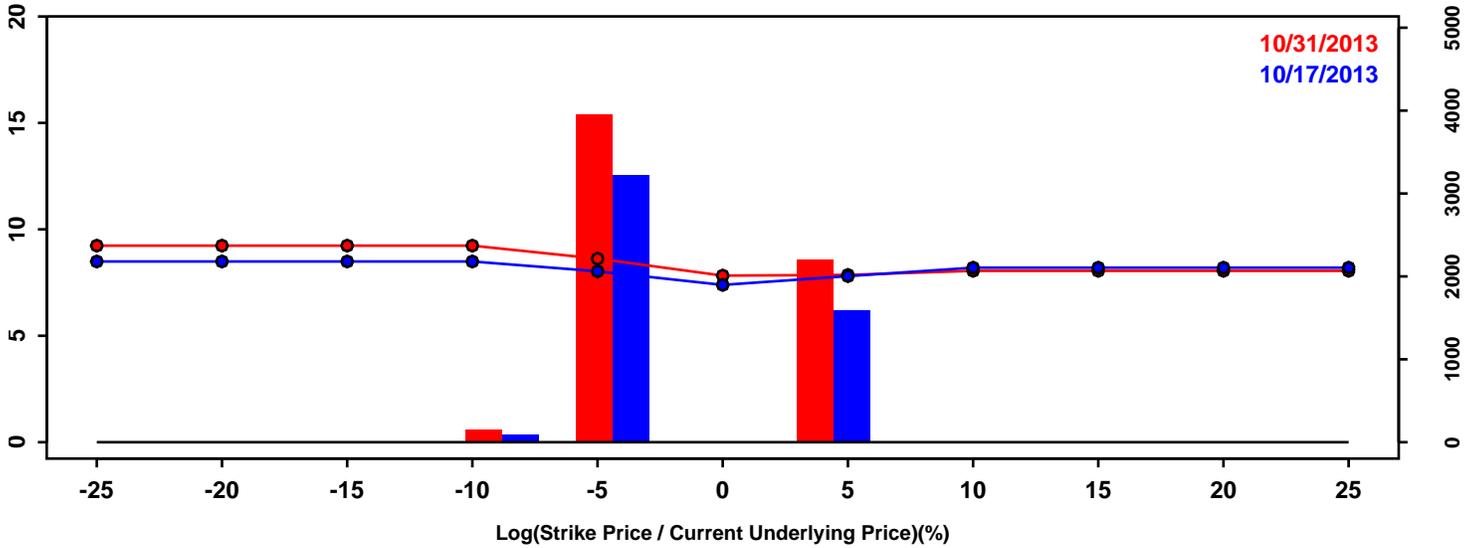


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-29.48%	-27.70%	1.78%
50th Pct	0.05%	0.56%	0.51%
90th Pct	25.62%	24.66%	-0.96%
Mean	-0.95%	-0.52%	0.43%
Std Dev	22.29%	21.07%	-1.22%
Skew	-0.22	-0.27	-0.05
Kurtosis	0.62	0.55	-0.08

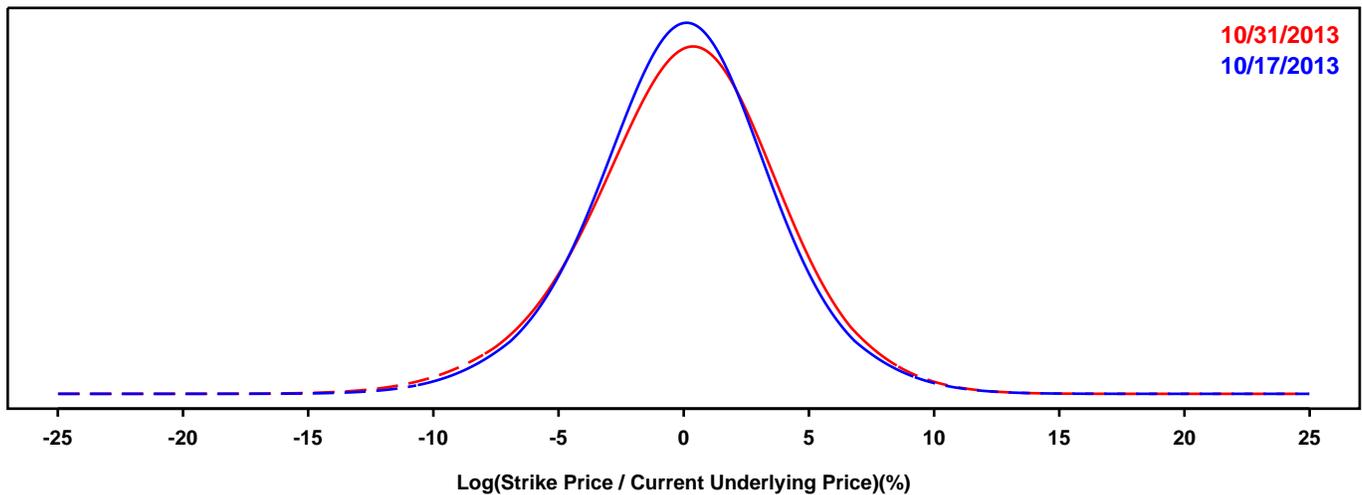
### RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- DOLLAR-EURO EXCHANGE RATE FUTURES

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

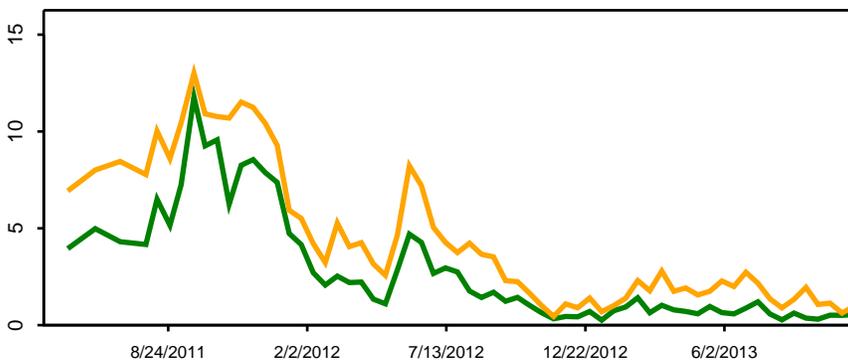
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change



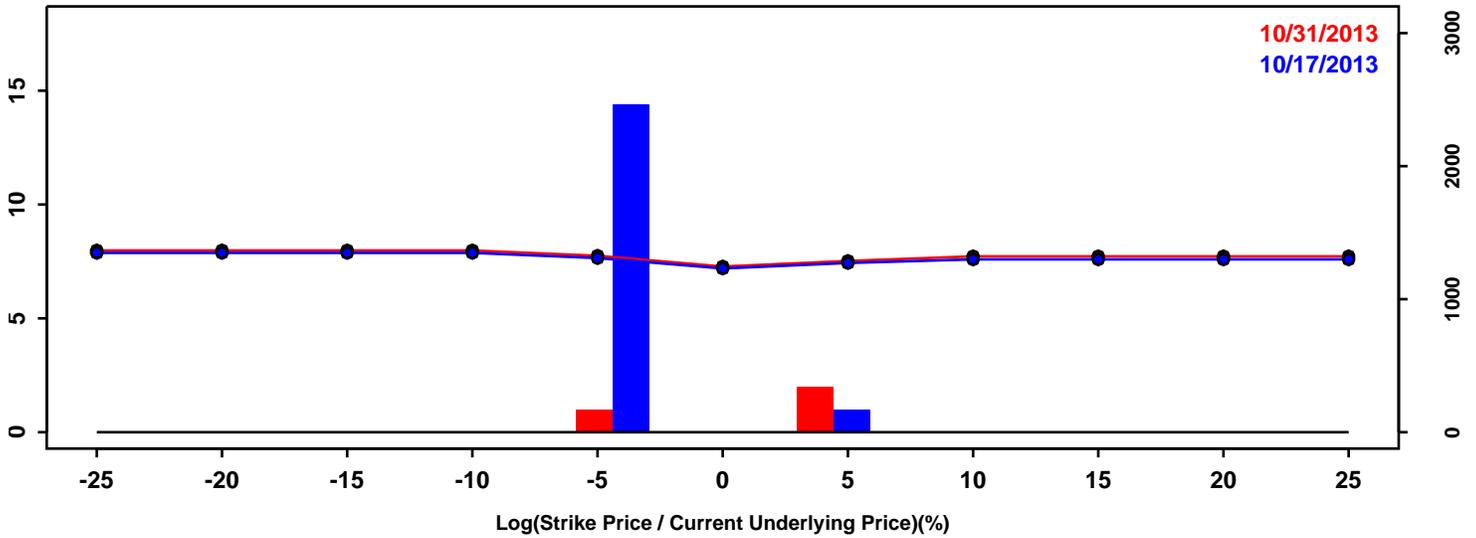
Decrease <= -10% [stronger \$]    Increase >= 10% [weaker \$]

Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-4.62%	-4.88%	-0.26%
50th Pct	0.06%	0.14%	0.08%
90th Pct	4.53%	4.88%	0.34%
Mean	0.03%	0.09%	0.06%
Std Dev	3.68%	3.90%	0.22%
Skew	-0.06	-0.18	-0.12
Kurtosis	0.50	0.44	-0.06

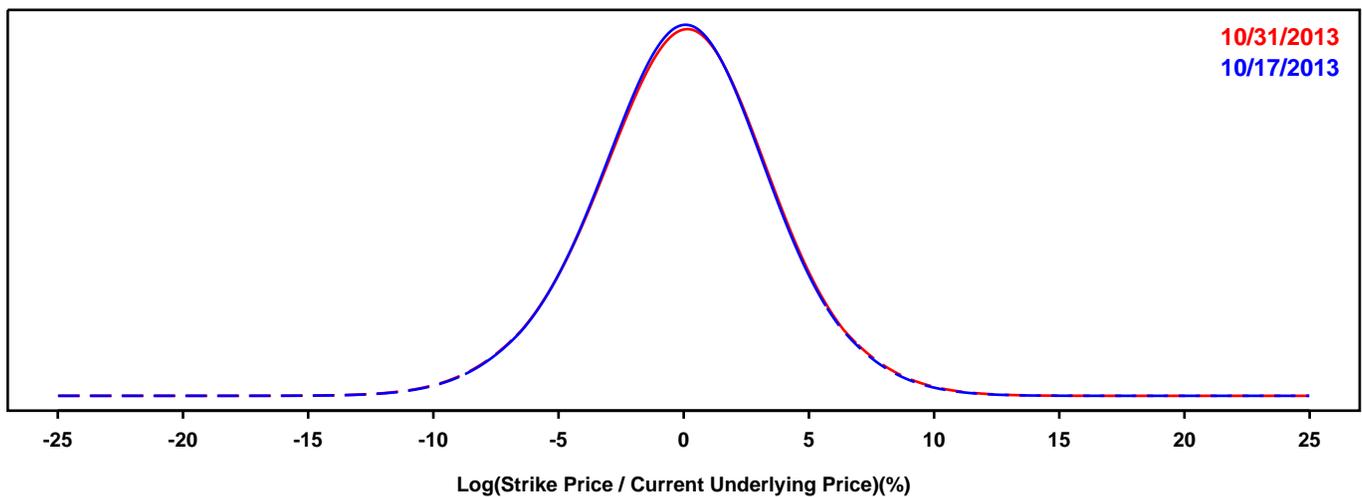
### RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- DOLLAR-POUND EXCHANGE RATE FUTURES

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

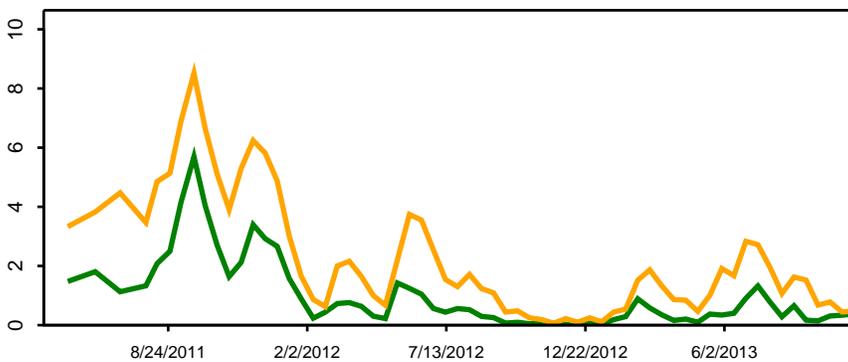
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change



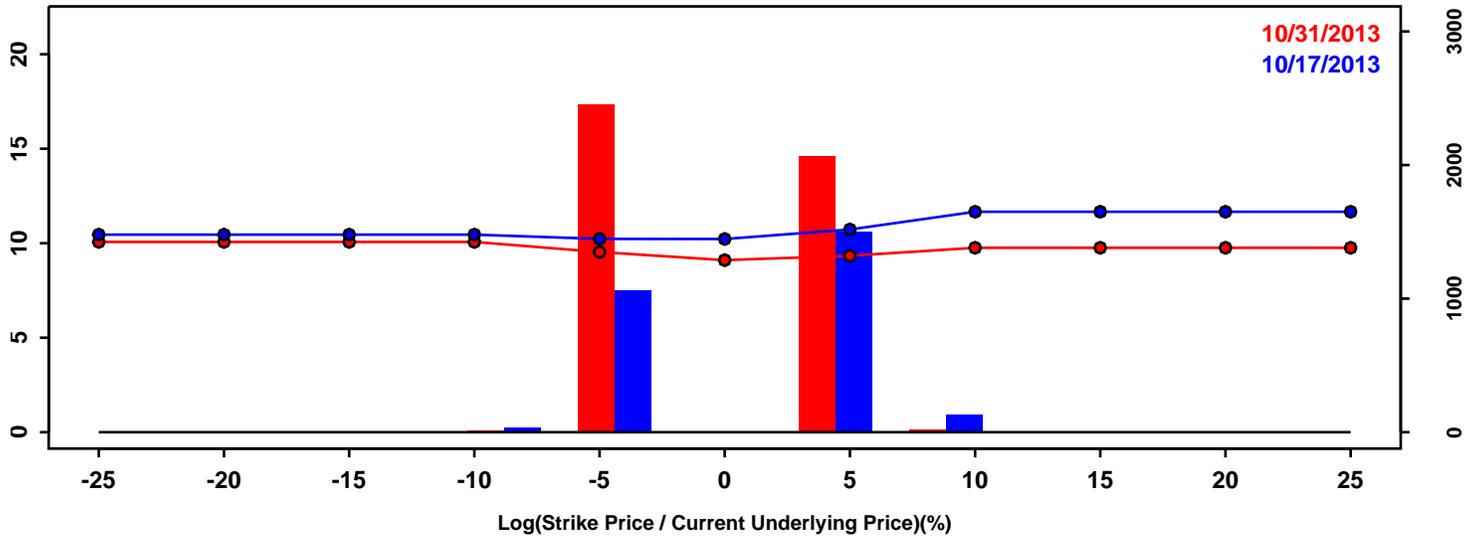
Decrease <= -10% [stronger \$]    Increase >= 10% [weaker \$]

Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-4.56%	-4.59%	-0.03%
50th Pct	0.00%	0.07%	0.07%
90th Pct	4.47%	4.53%	0.06%
Mean	0.00%	0.04%	0.04%
Std Dev	3.59%	3.63%	0.04%
Skew	-0.05	-0.06	-0.00
Kurtosis	0.30	0.31	0.01

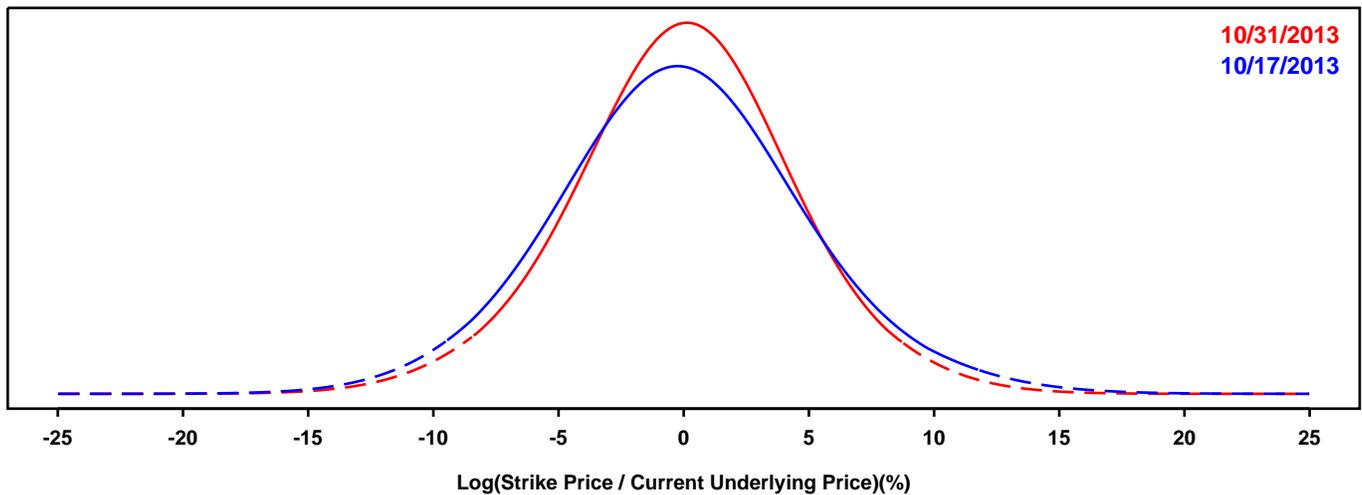
### RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- DOLLAR-YEN EXCHANGE RATE FUTURES

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

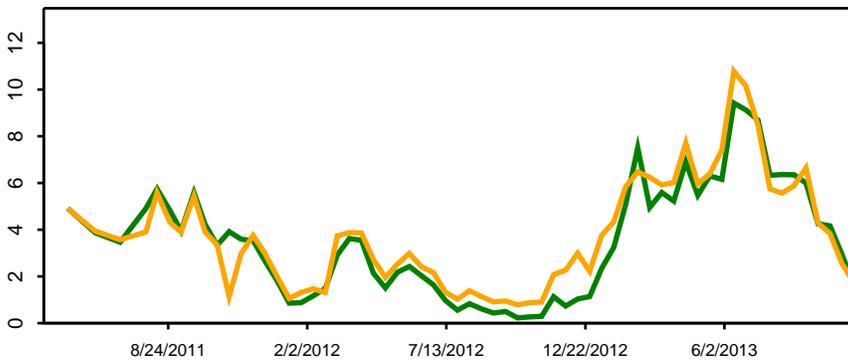
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change



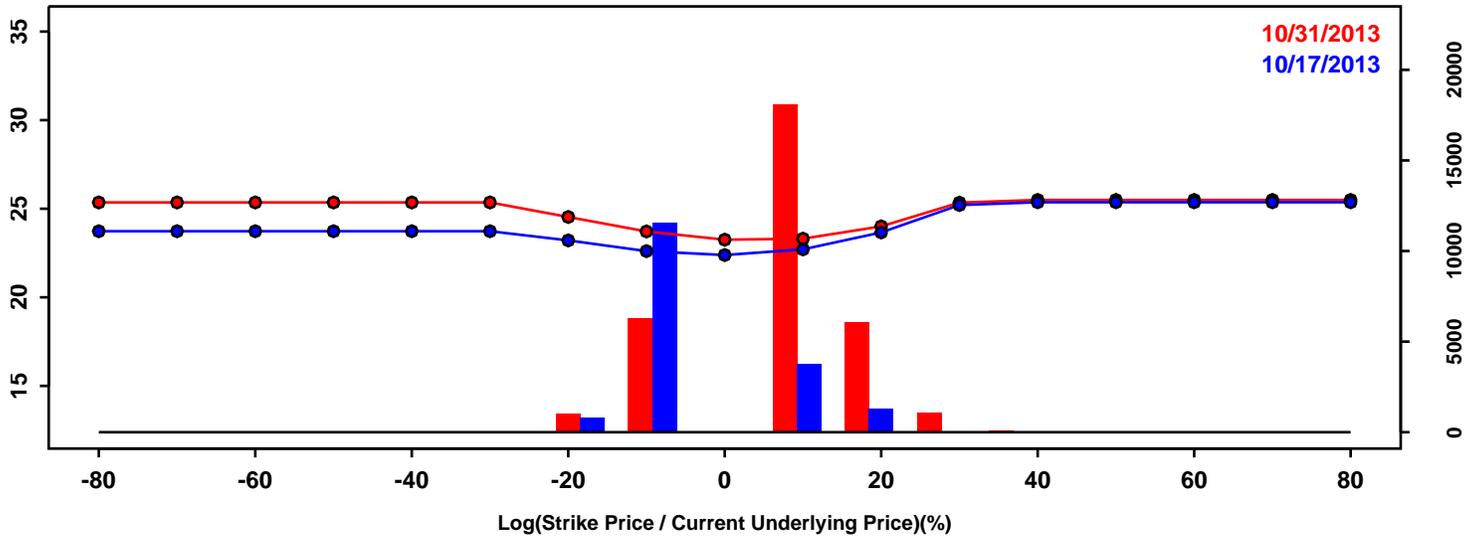
Decrease <= -10% [stronger \$]    Increase >= 10% [weaker \$]

Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-6.46%	-5.69%	0.77%
50th Pct	-0.18%	0.07%	0.25%
90th Pct	6.40%	5.70%	-0.70%
Mean	-0.05%	0.06%	0.11%
Std Dev	5.10%	4.54%	-0.56%
Skew	0.11	-0.04	-0.16
Kurtosis	0.33	0.35	0.02

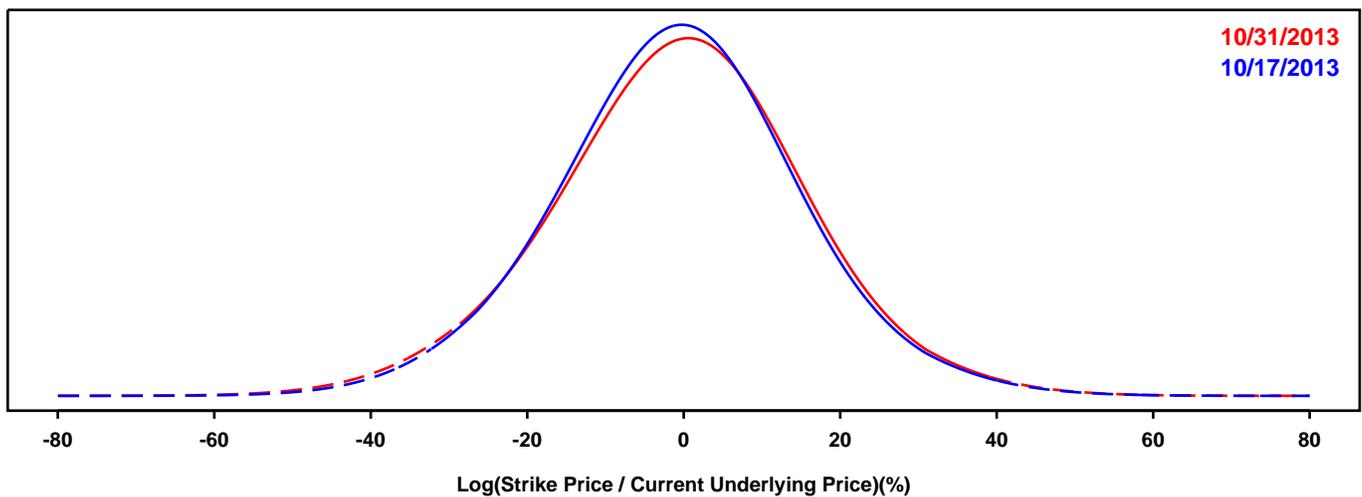
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- CORN FUTURES

Log returns are based on the risk neutral density function of the underlying asset derived from options that expire in approximately 6 months.

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



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

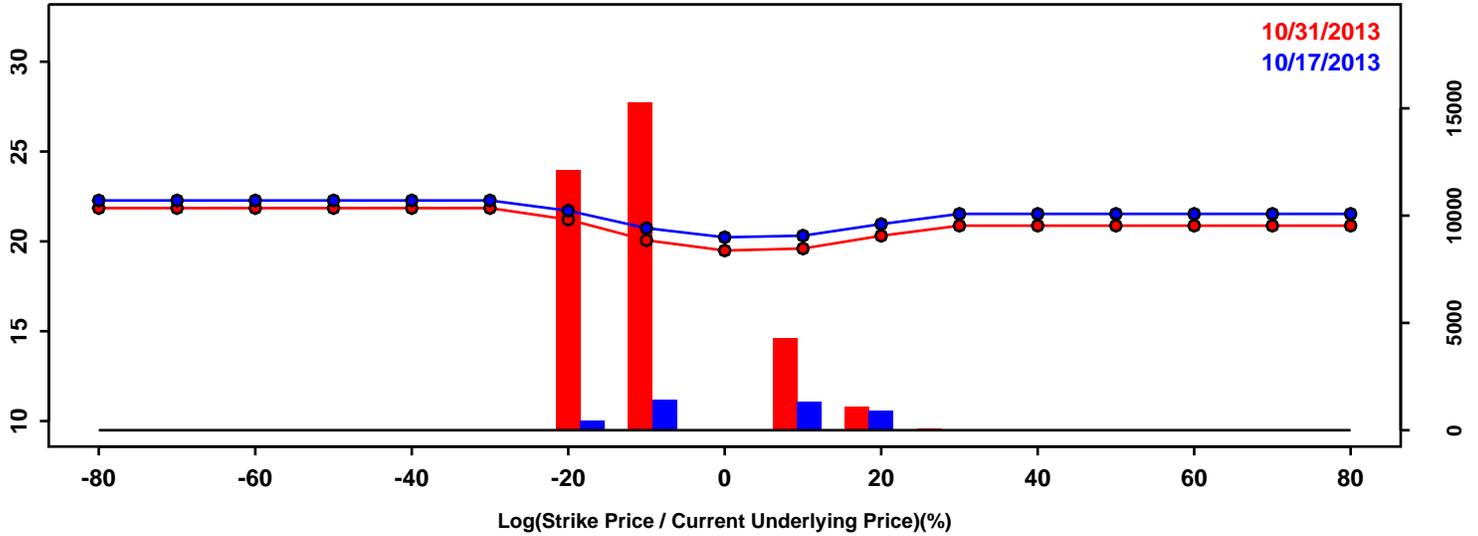


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-20.58%	-21.35%	-0.77%
50th Pct	-0.59%	-0.17%	0.42%
90th Pct	19.01%	19.80%	0.79%
Mean	-0.63%	-0.43%	0.20%
Std Dev	15.79%	16.39%	0.60%
Skew	0.02	-0.06	-0.08
Kurtosis	0.35	0.35	-0.01

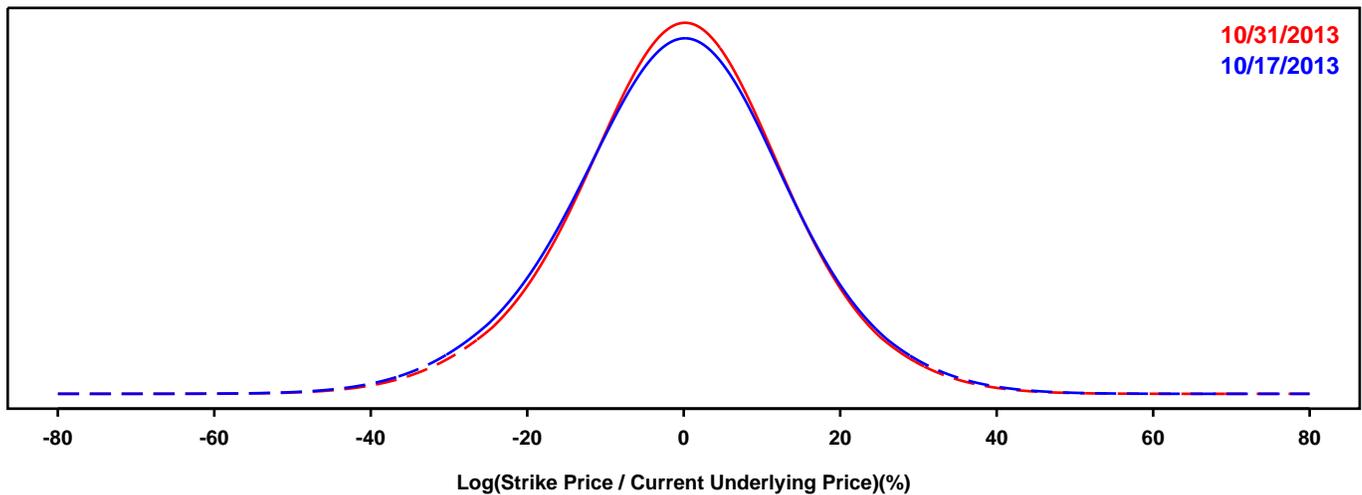
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- SOYBEAN FUTURES

Log returns are based on the risk neutral density function of the underlying asset derived from options that expire in approximately 6 months.

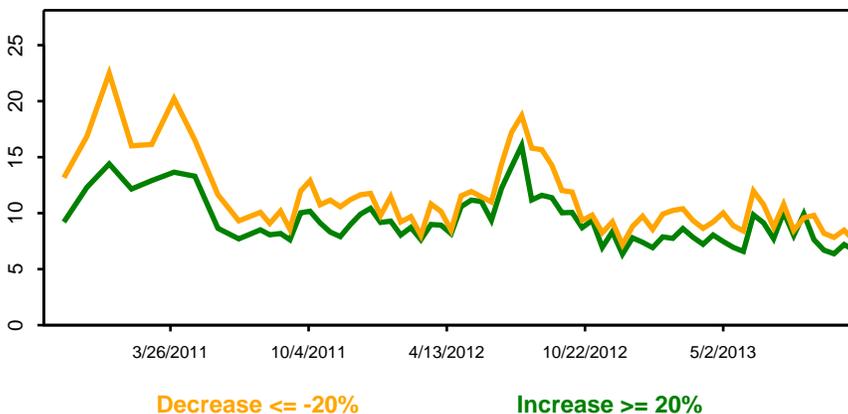
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

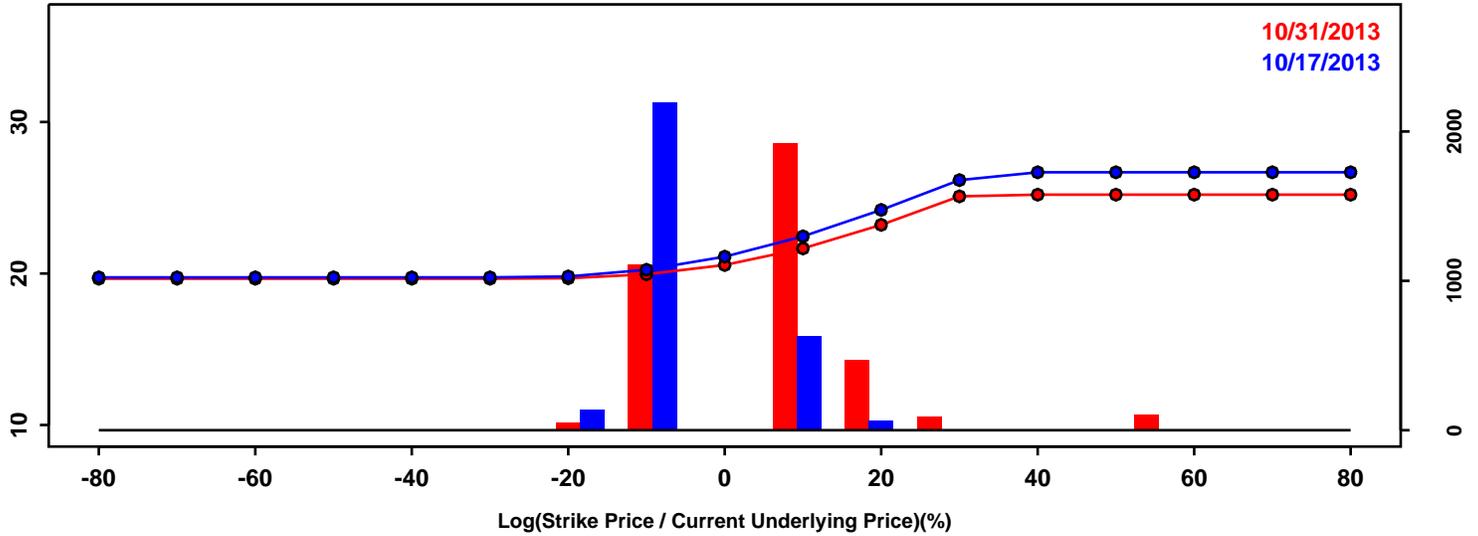


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-18.55%	-17.56%	0.99%
50th Pct	-0.21%	-0.06%	0.16%
90th Pct	17.34%	16.84%	-0.50%
Mean	-0.40%	-0.21%	0.19%
Std Dev	14.28%	13.75%	-0.53%
Skew	-0.07	-0.08	-0.01
Kurtosis	0.33	0.38	0.05

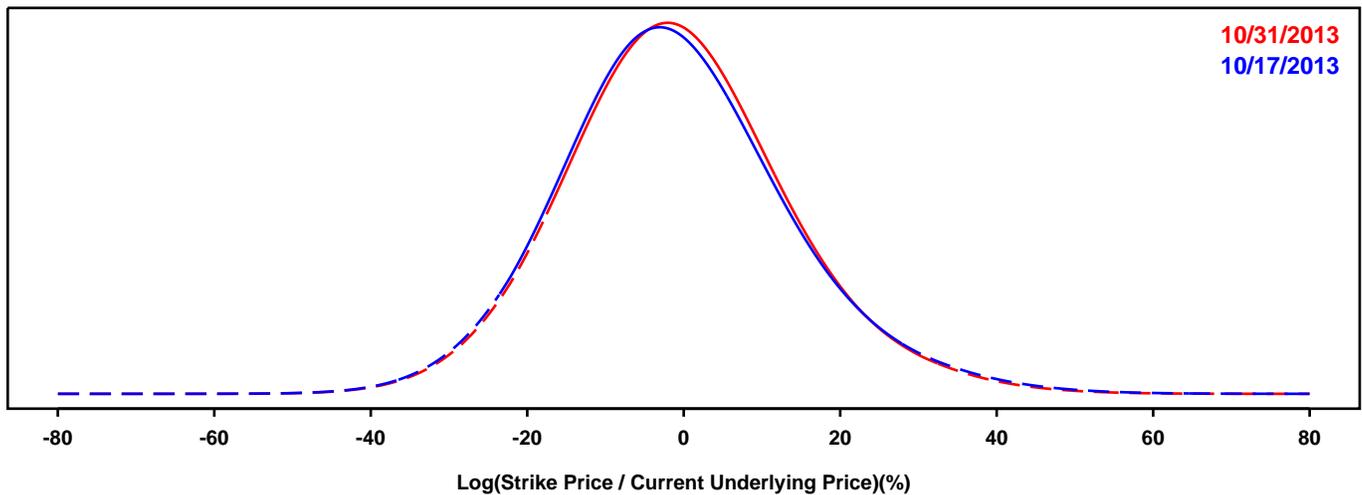
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- WHEAT FUTURES

Log returns are based on the risk neutral density function of the underlying asset derived from options that expire in approximately 6 months.

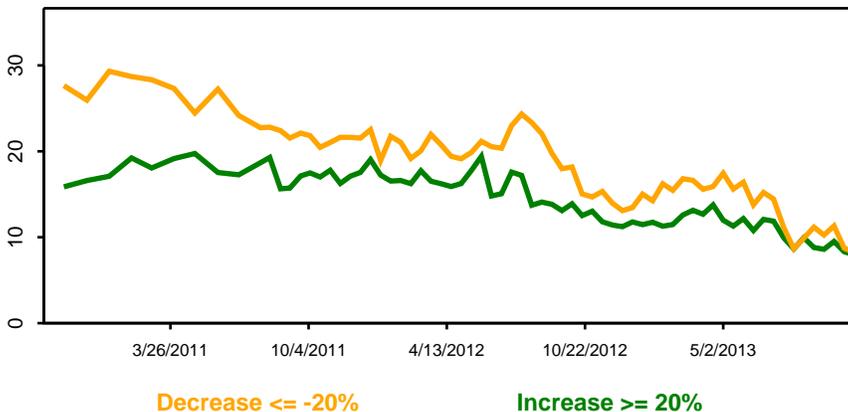
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

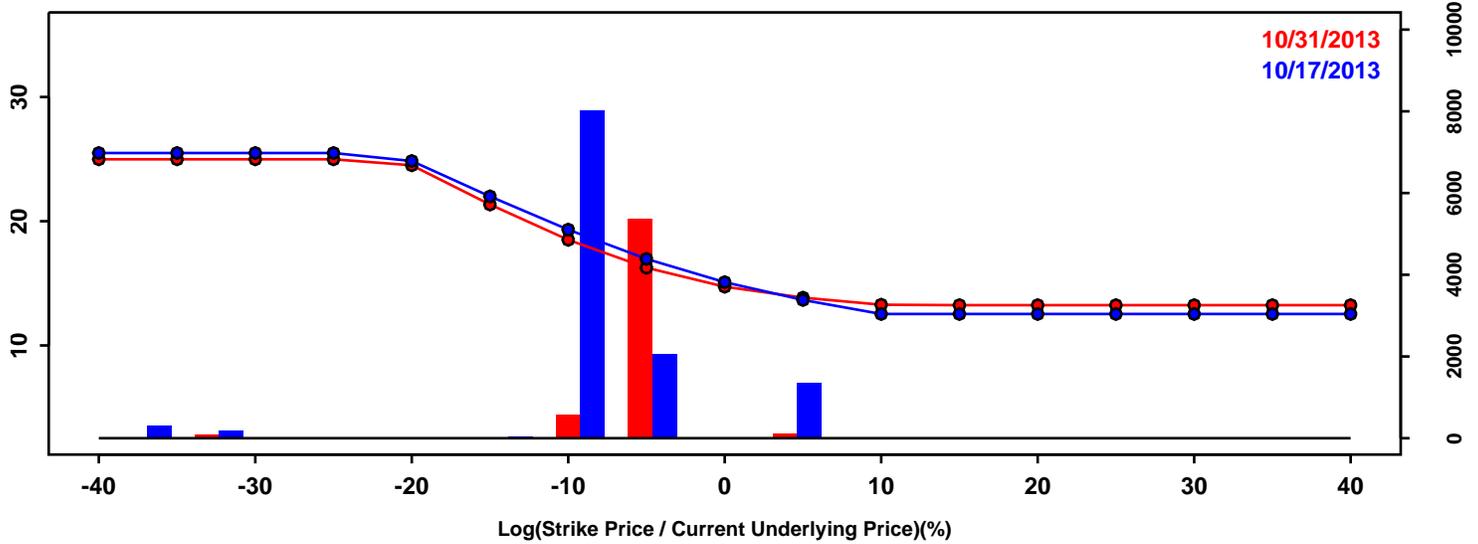


Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-18.99%	-18.55%	0.44%
50th Pct	-1.74%	-1.26%	0.48%
90th Pct	18.18%	17.83%	-0.34%
Mean	-0.89%	-0.66%	0.23%
Std Dev	14.87%	14.50%	-0.38%
Skew	0.35	0.27	-0.08
Kurtosis	0.52	0.43	-0.09

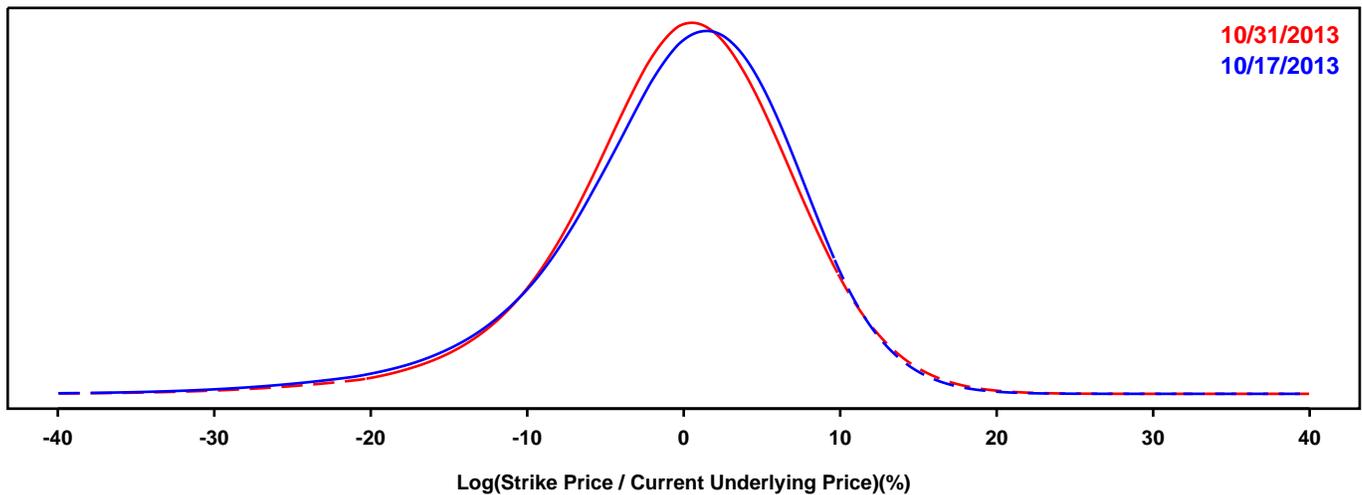
### RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- iSHARES DOW JONES US REAL ESTATE

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

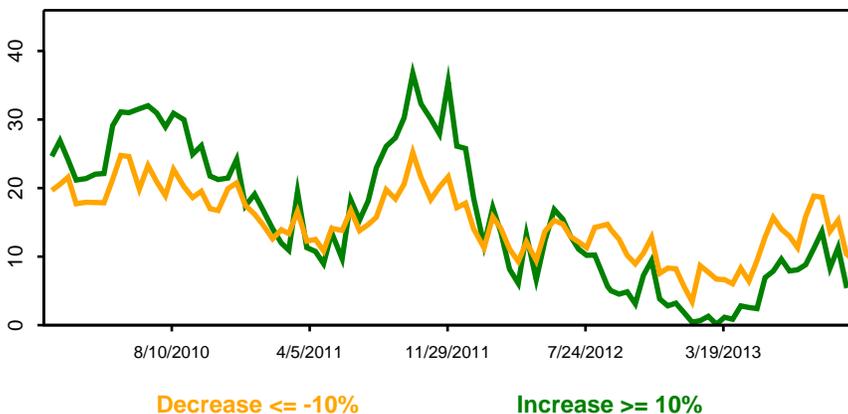
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



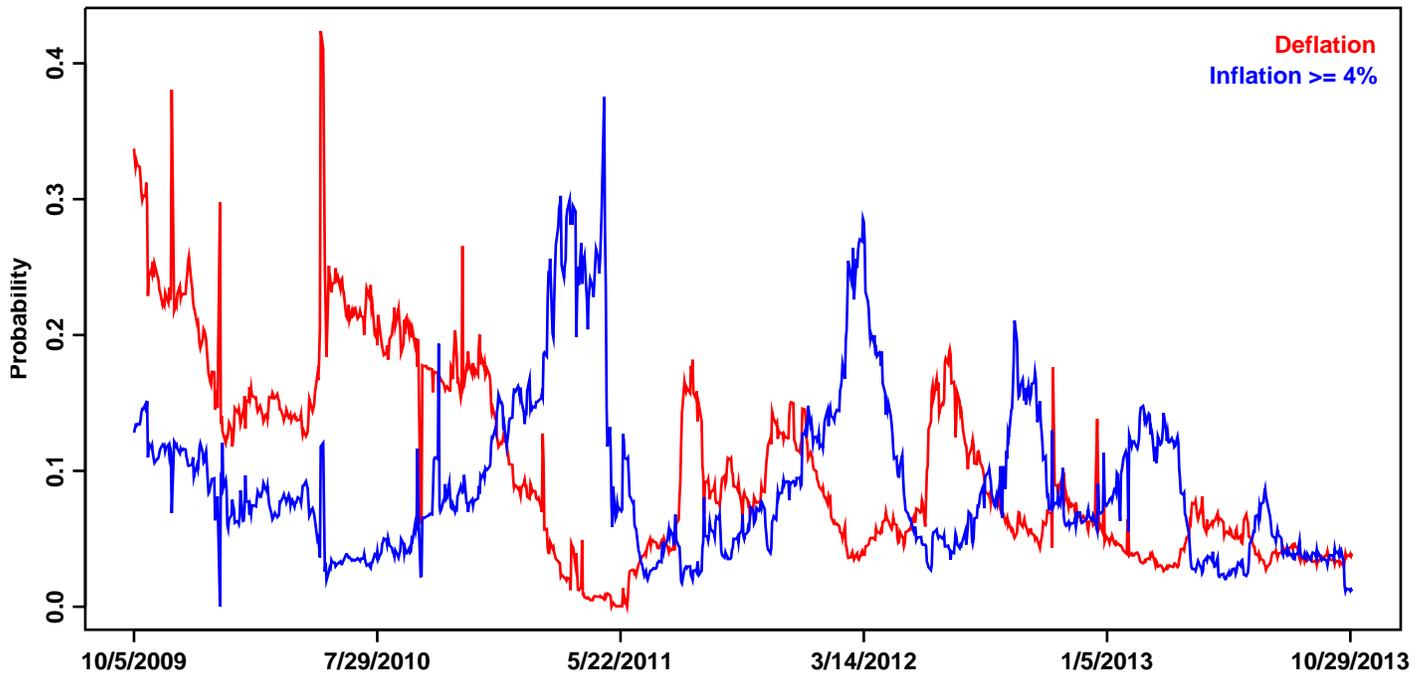
Probability of a Large Change



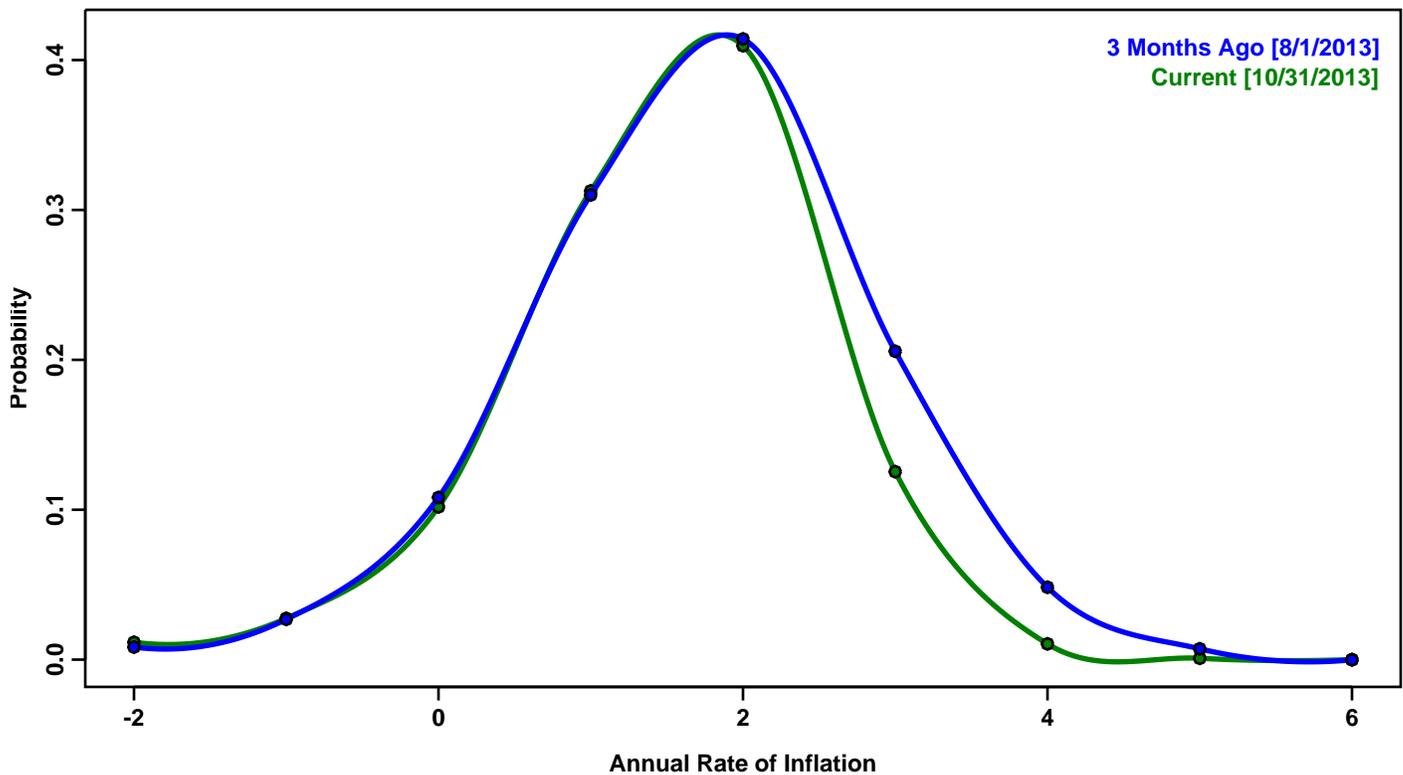
Statistics of the Log Return Distributions			
	10/17/2013	10/31/2013	Change
10th Pct	-10.24%	-9.61%	0.63%
50th Pct	0.37%	0.12%	-0.25%
90th Pct	8.35%	8.35%	0.00%
Mean	-0.46%	-0.40%	0.06%
Std Dev	7.76%	7.47%	-0.30%
Skew	-0.86	-0.68	0.18
Kurtosis	1.75	1.59	-0.17

# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- Inflation Caps & Floors

## Probability of Deflation and High Inflation over the next 12 Months



## Risk Neutral Density Function for Inflation over the next 12 Months



# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- Inflation Caps & Floors

## Probability of Deflation and High Inflation over the next 5 Years

