

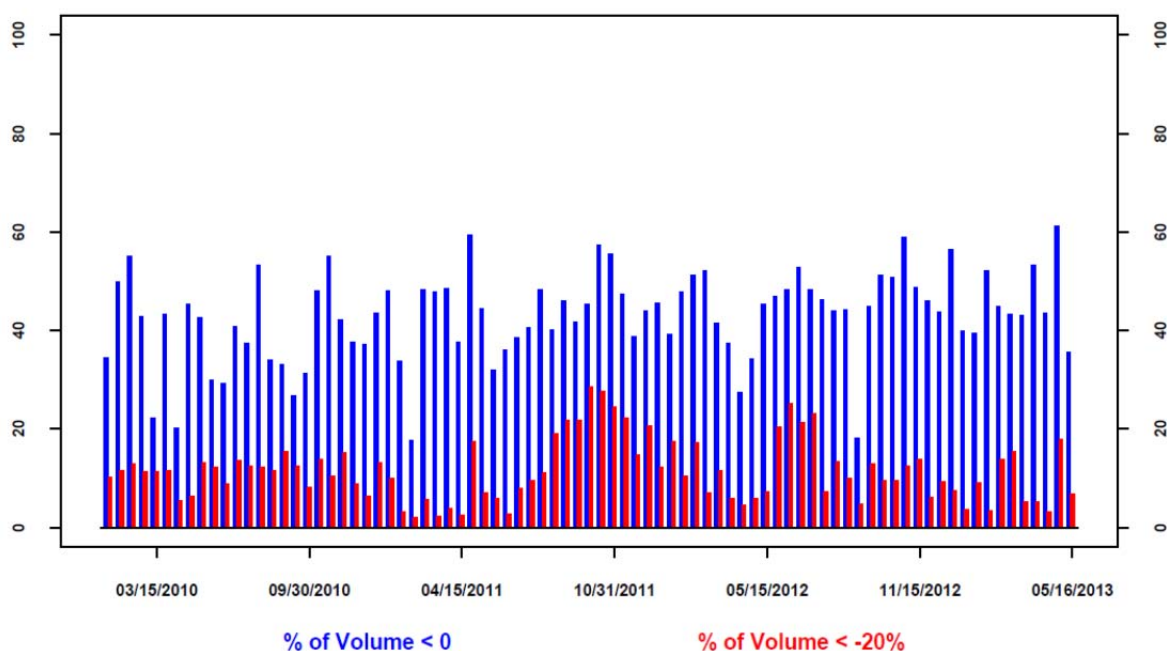
FEDERAL RESERVE BANK OF MINNEAPOLIS  
BANKING AND POLICY STUDIES

Minneapolis Options Report – May 17<sup>th</sup>

*Banks*

Trading in options on bank stocks was near six month averages last week. Upside volume percentages were high the CCAR firms (note the last blue bar in the chart below). Spot returns in the group were up smartly again including double digit percentage increases for MS and STT over the past two weeks. The median CCAR bank stock rose 6.6%.

Aggregate Volumes for Options on CCAR Banks



RNPD standard deviations generally rose modestly relative to our last report and RNPD skews became less negative. Risk neutral probabilities of large changes remain in their downward trends.

Additional notes:

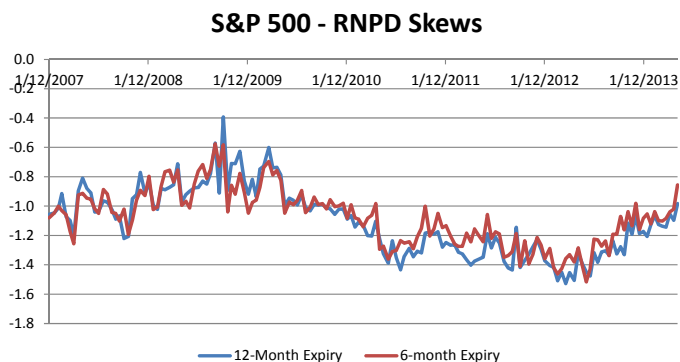
- Trading in options on BK stock was almost entirely below the current spot price. These shares rose approximately 7% over the past two weeks.
- MS options volumes were quite strong again last week. The RNPD was largely unchanged.

### *Other Commodity Markets*

We continue to measure high volumes in the options markets across the spectrum of commodities and indices we follow. Changes in RNP standard deviations derived from options were mixed, rising for the precious metals and the S&P 500, but falling for the grains.

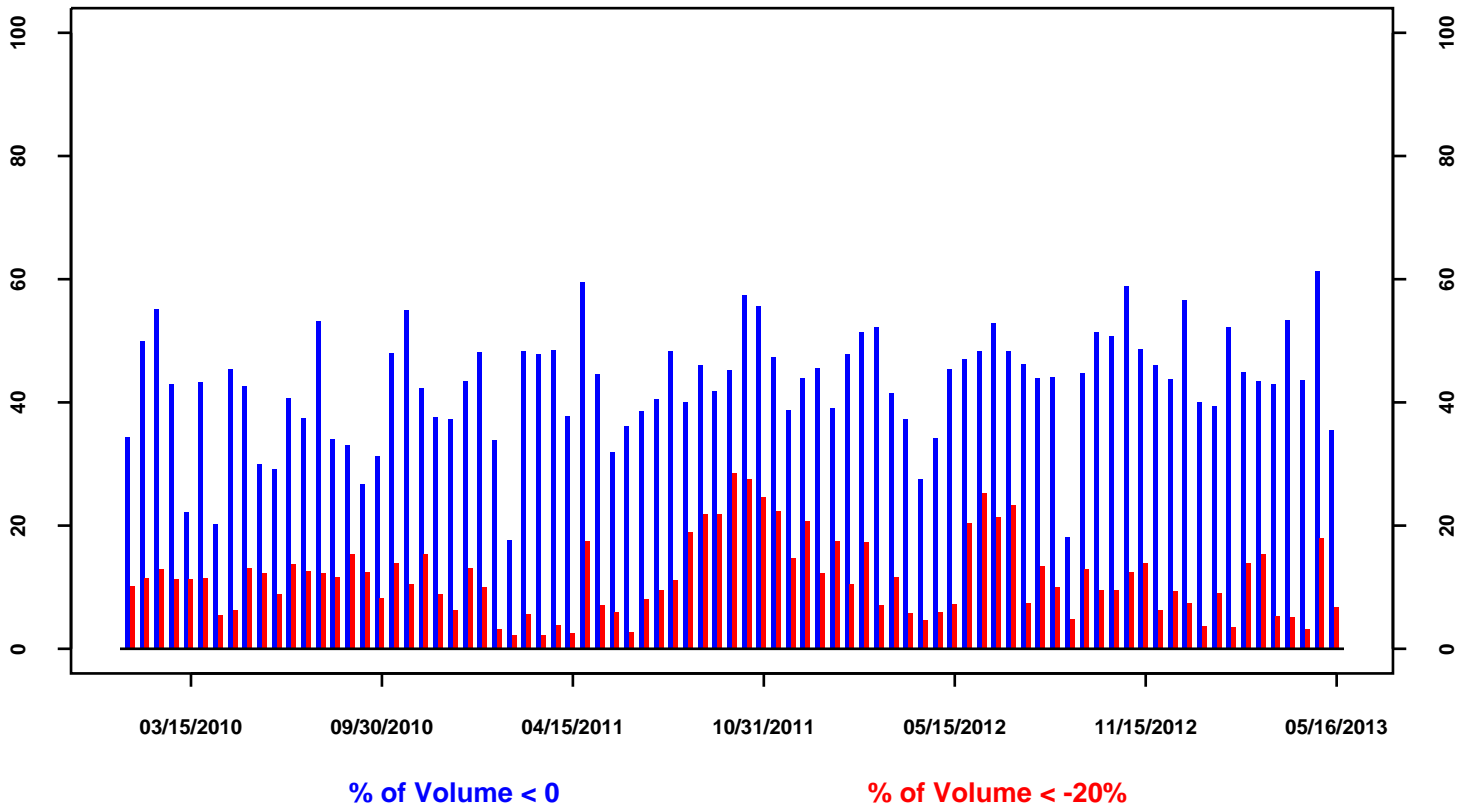
Additional notes:

- Risk neutral probabilities of large downside moves in the S&P 500 remain elevated relative to large upside moves. RNP standard deviations and skews rose last week as well. (*See S&P 500 reports*)

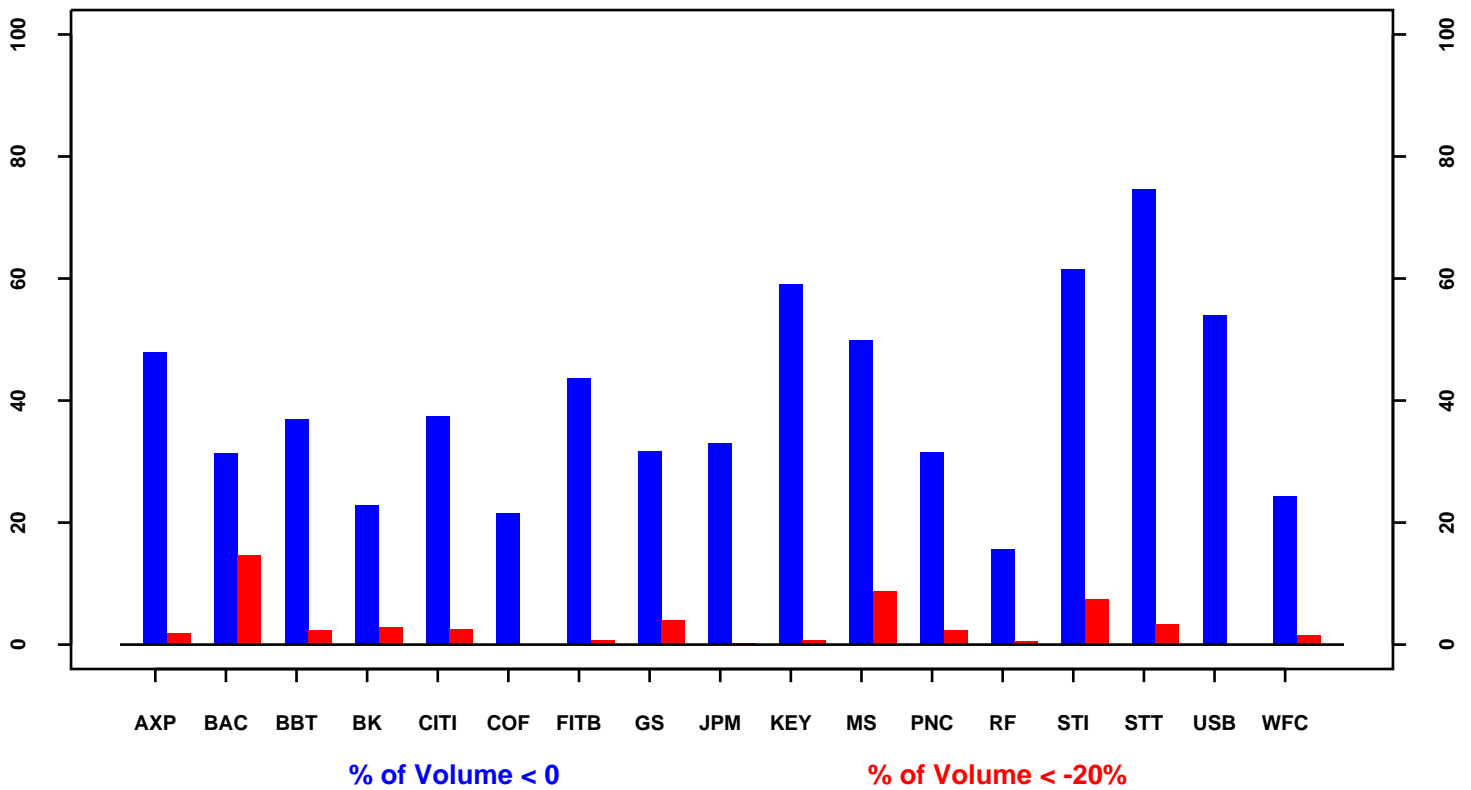


- Risk neutral probabilities of large upside moves fell in the grain markets last week as did RNP standard deviations. Volatility smiles shifted lower. (*See grain market reports*)
- Gold and Silver spot prices reversed their rallies from two weeks ago. The RNP skew for gold became more negative again last week. Tail risks, as measured by both RNP standard deviation and risk neutral probabilities of large moves, rose in both markets. (*See Gold and Silver reports*)
- Options on exchange rate futures continue to trade actively in all three currencies we follow. Statistics from RNPs derived from options on exchange rate futures remained largely unchanged again last week. (*See exchange rate reports*)
- The DJ Real Estate Index rose 2.1% over the past two weeks. The RNP skew derived from options on the ETF became more negative and the standard deviation rose. These changes occurred on light trading. (*See real estate report*)

### Aggregate Volumes for Options on CCAR Banks

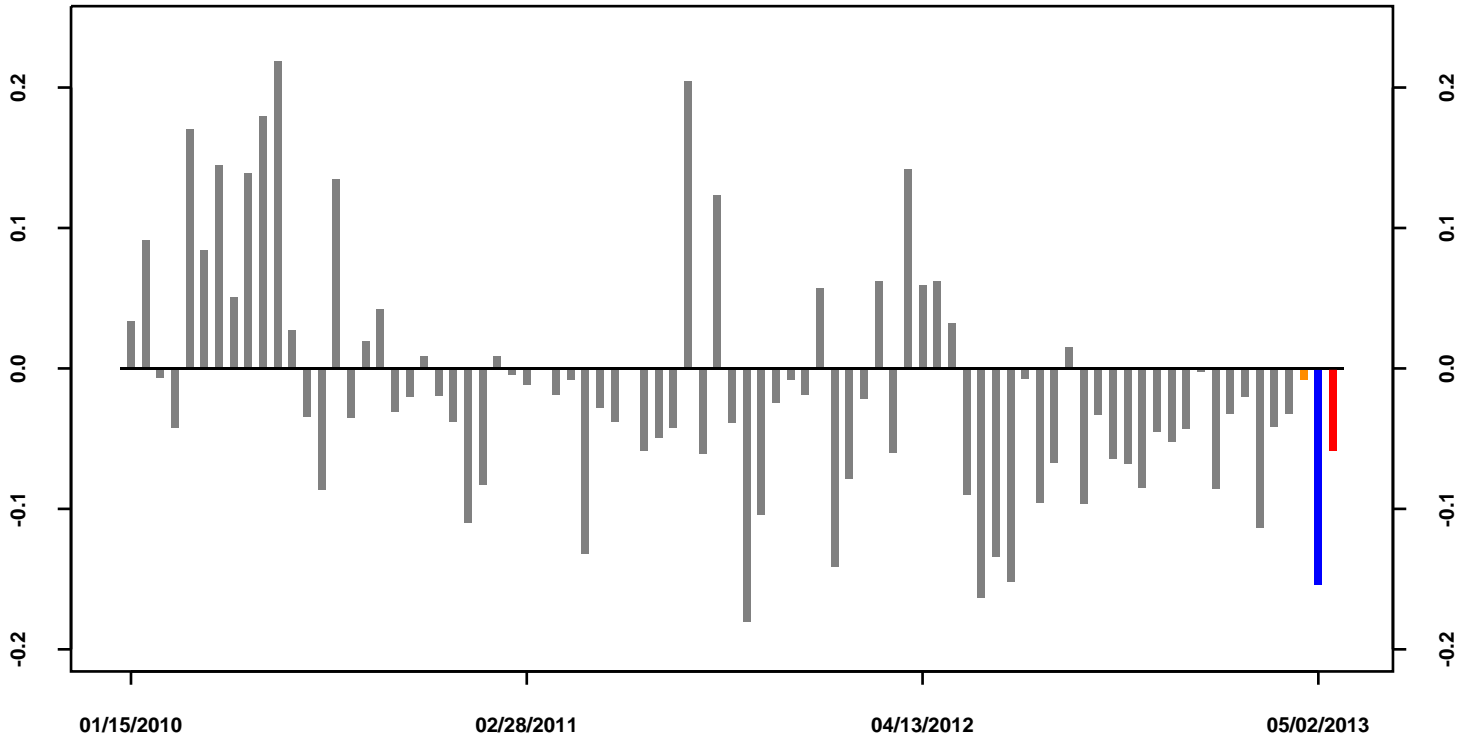


### Volumes for Options on CCAR Banks

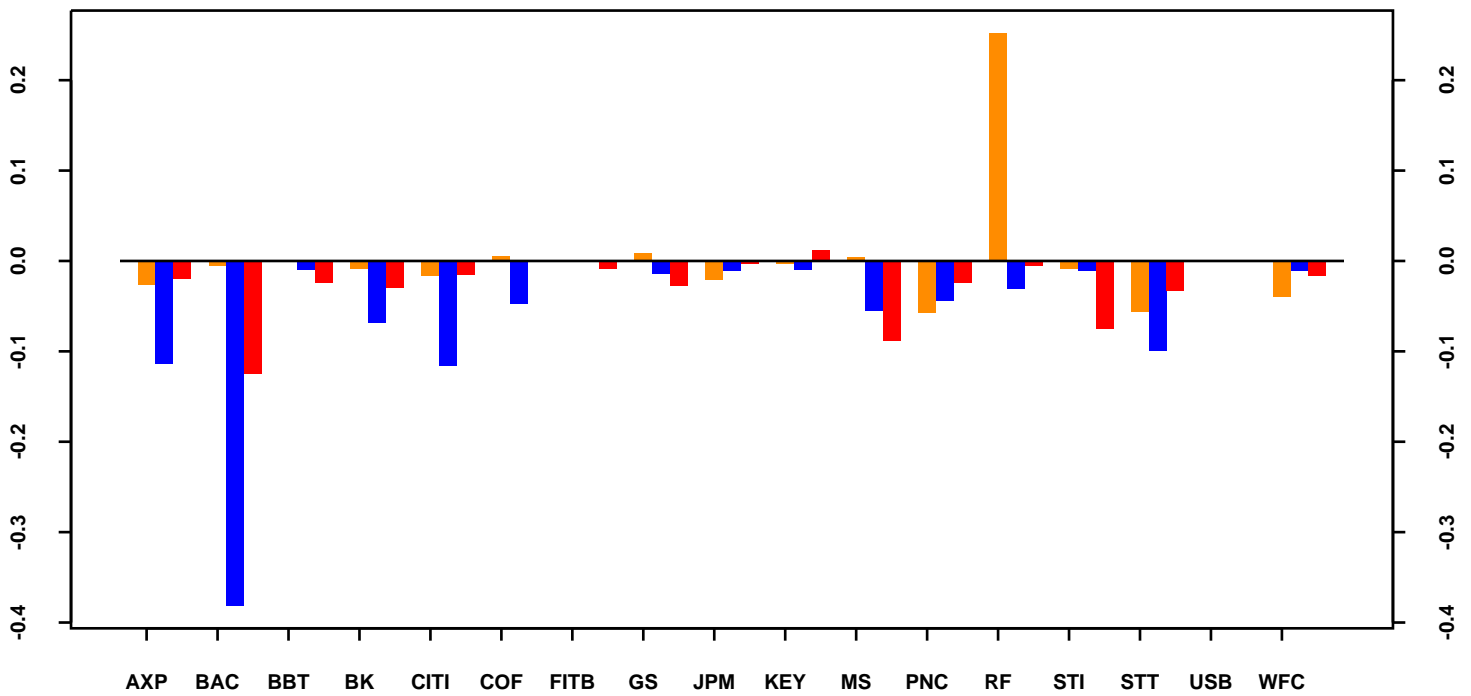


### Aggregate Volume Skew--CCAR Banks

(% of volume traded in deep out-of-the-money calls LESS % of volume traded in deep out-of-the-money puts)



### CCAR Bank Volume Skew -- Last Three Periods



04/18/2013

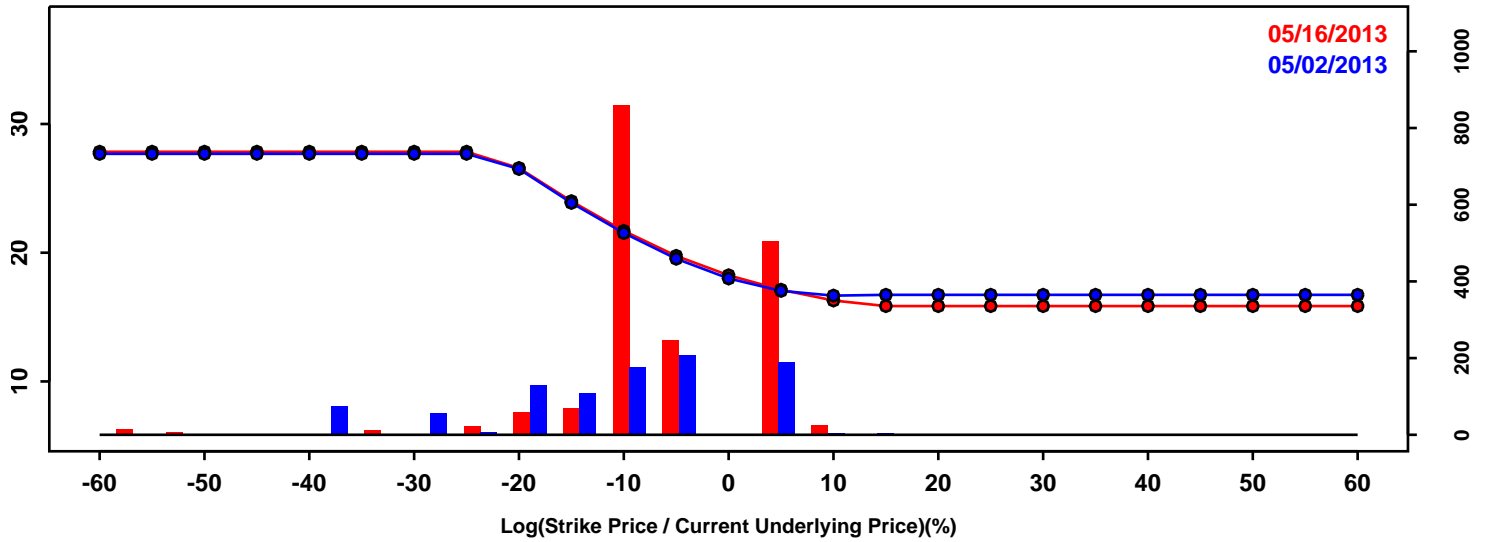
05/02/2013

05/16/2013

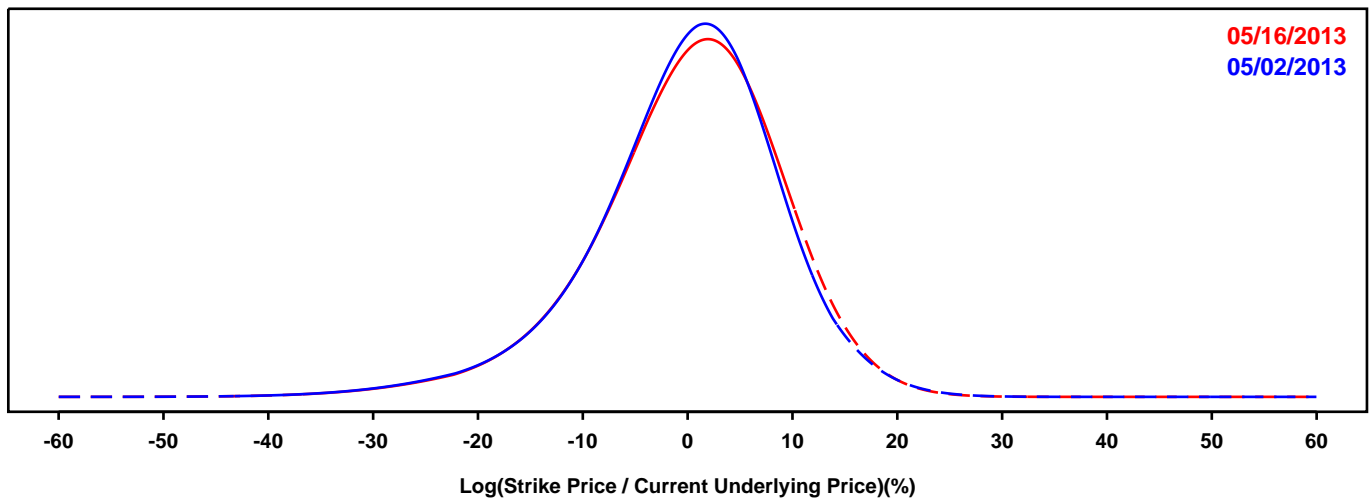
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- AMERICAN EXPRESS

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

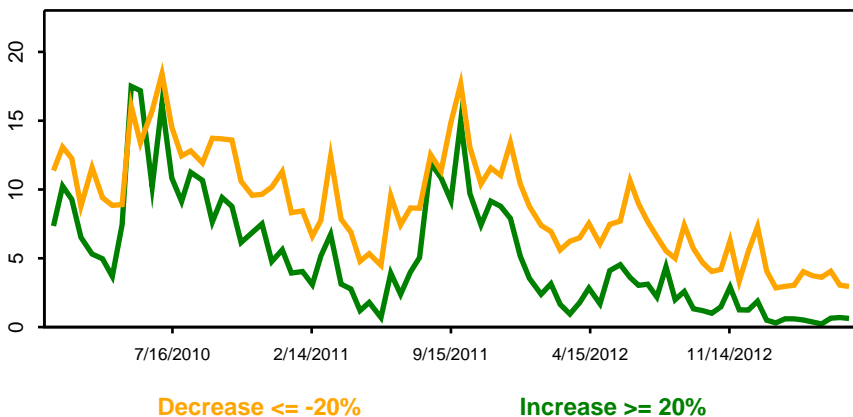
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

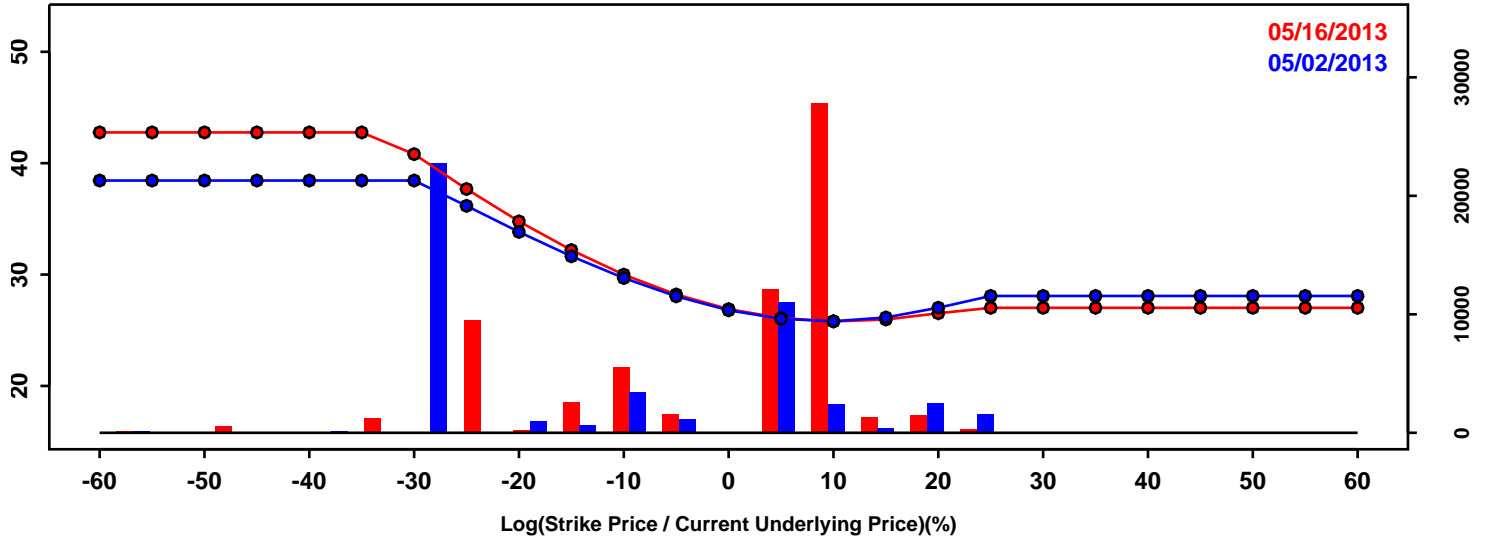


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-11.72%	-11.64%	0.08%
50th Pct	0.58%	0.79%	0.22%
90th Pct	10.26%	10.75%	0.49%
Mean	-0.22%	0.02%	0.24%
Std Dev	9.13%	9.21%	0.08%
Skew	-0.66	-0.66	0.00
Kurtosis	1.36	1.22	-0.14

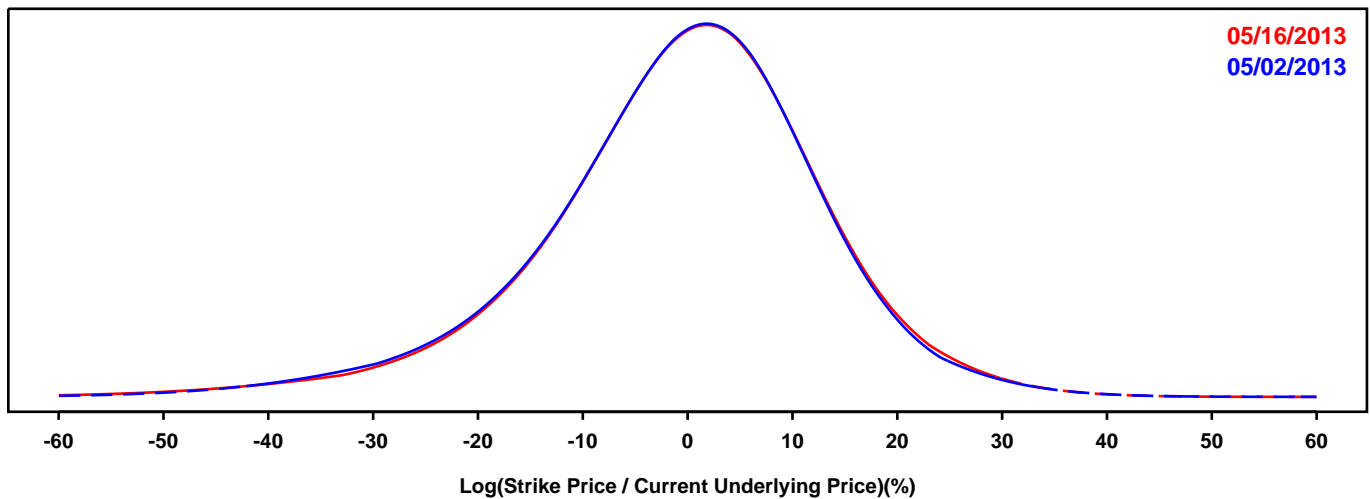
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- BANK OF AMERICA

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

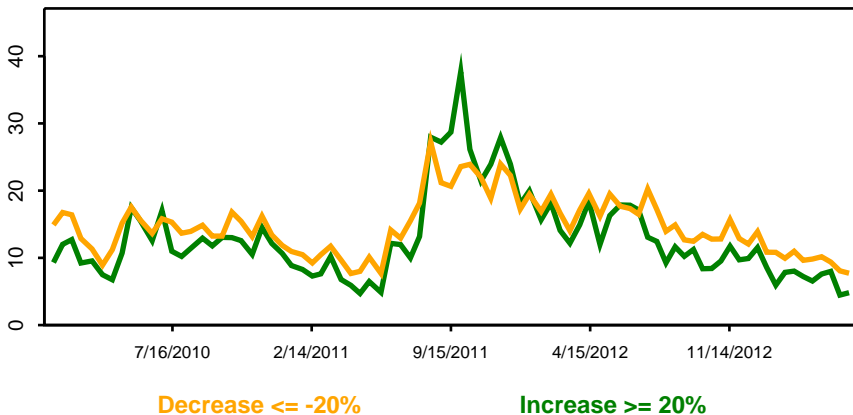
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

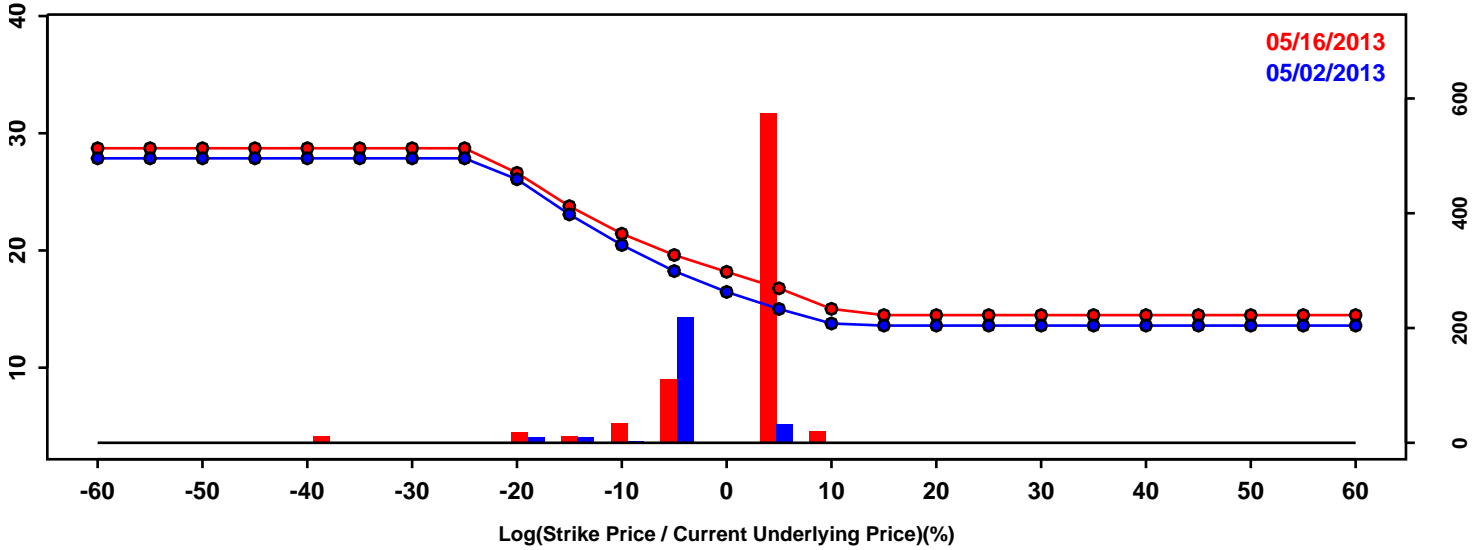


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-17.80%	-17.36%	0.44%
50th Pct	0.29%	0.45%	0.15%
90th Pct	14.82%	15.20%	0.38%
Mean	-0.76%	-0.55%	0.21%
Std Dev	13.54%	13.67%	0.12%
Skew	-0.54	-0.62	-0.07
Kurtosis	1.22	1.56	0.34

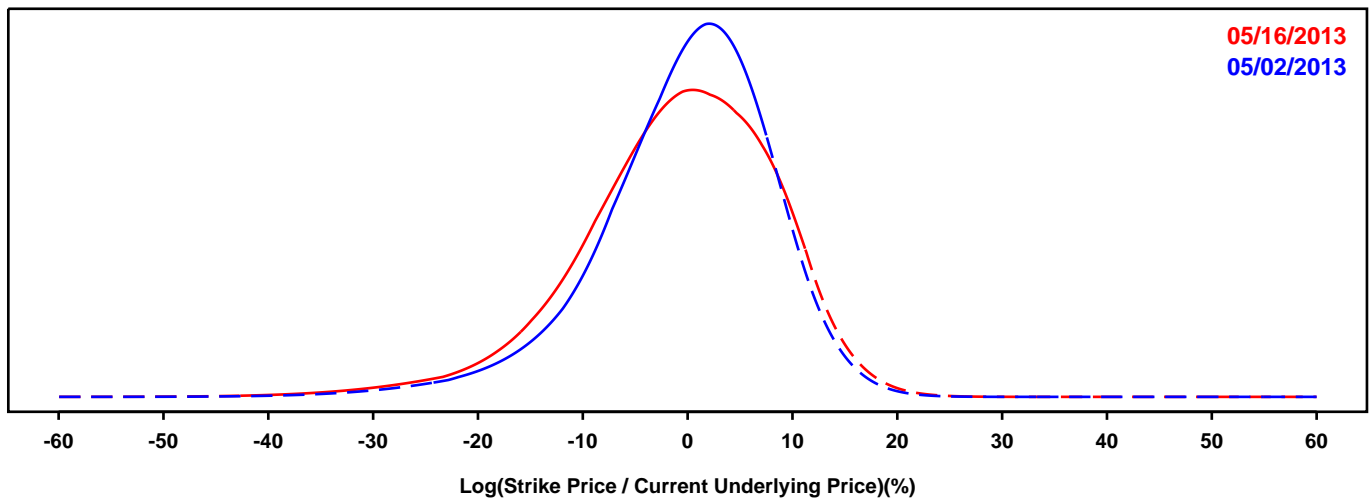
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- BB&T

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

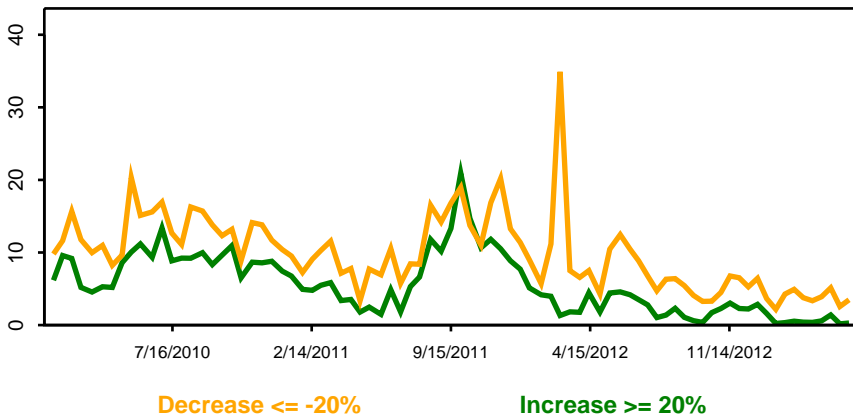
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

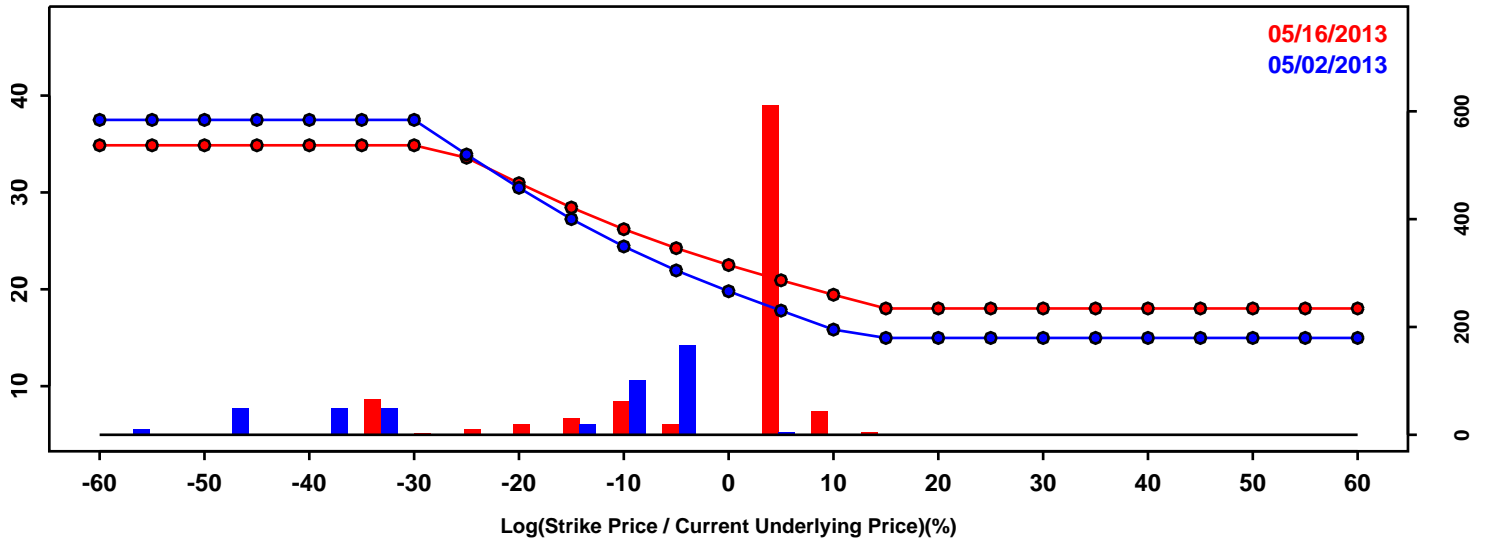


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-10.87%	-12.84%	-1.97%
50th Pct	0.66%	-0.11%	-0.77%
90th Pct	9.33%	10.08%	0.75%
Mean	-0.23%	-0.94%	-0.71%
Std Dev	8.45%	9.39%	0.94%
Skew	-0.84	-0.71	0.13
Kurtosis	1.69	1.16	-0.53

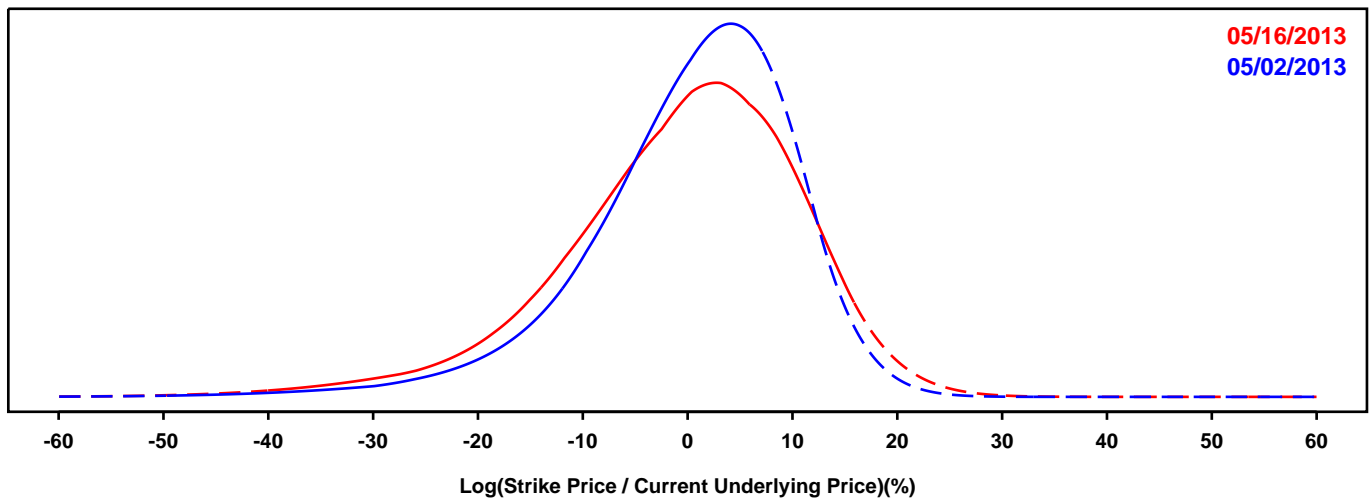
### RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- BANK OF NEW YORK MELLON

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

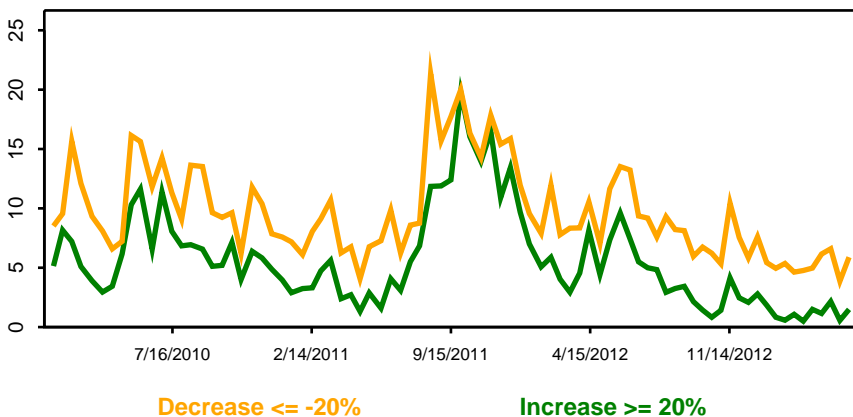
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change



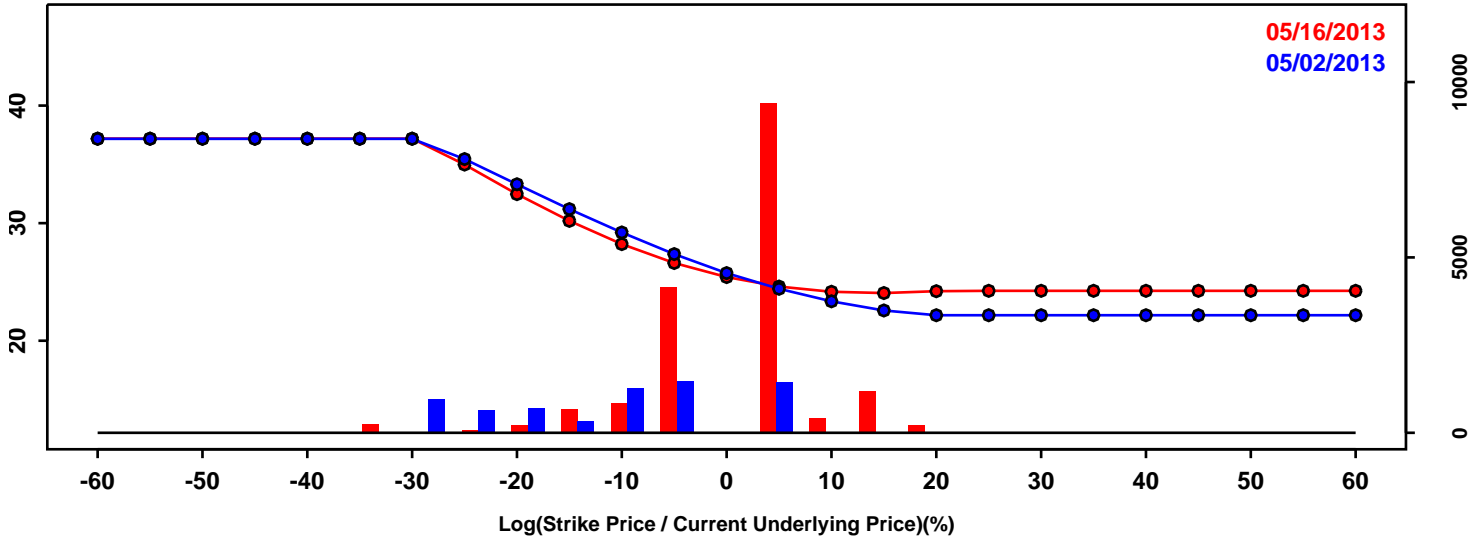
Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-12.38%	-15.35%	-2.98%
50th Pct	1.67%	0.64%	-1.03%
90th Pct	11.39%	12.57%	1.19%
Mean	0.31%	-0.64%	-0.95%
Std Dev	10.07%	11.54%	1.46%
Skew	-1.05	-0.79	0.26
Kurtosis	2.39	1.34	-1.05



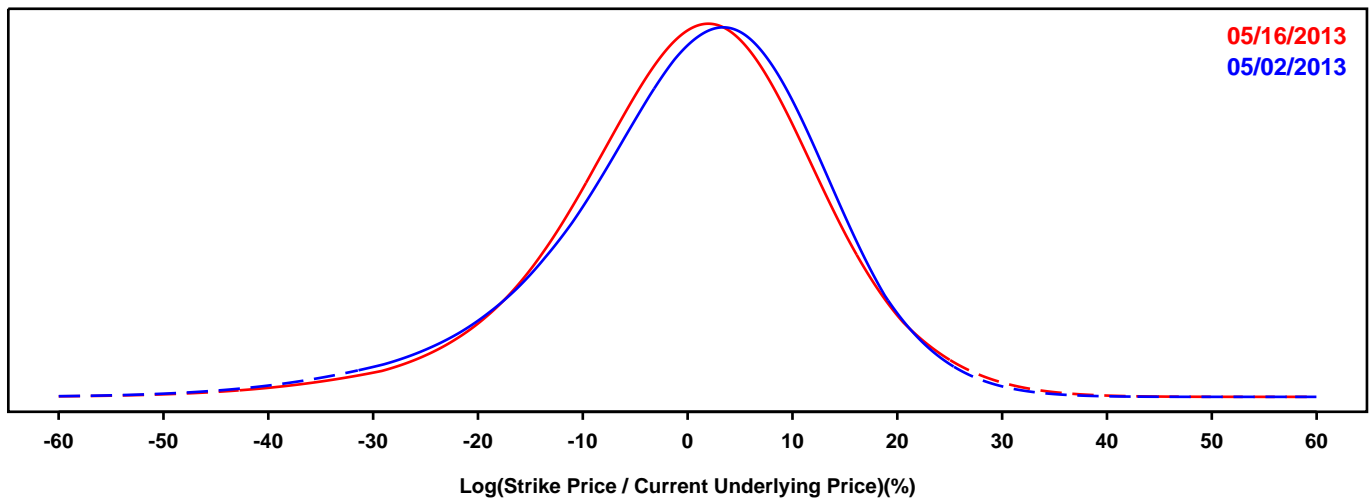
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- CITIGROUP

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

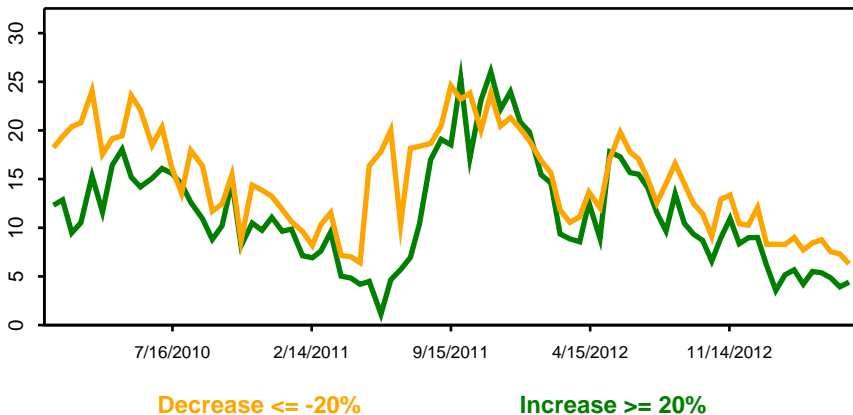
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

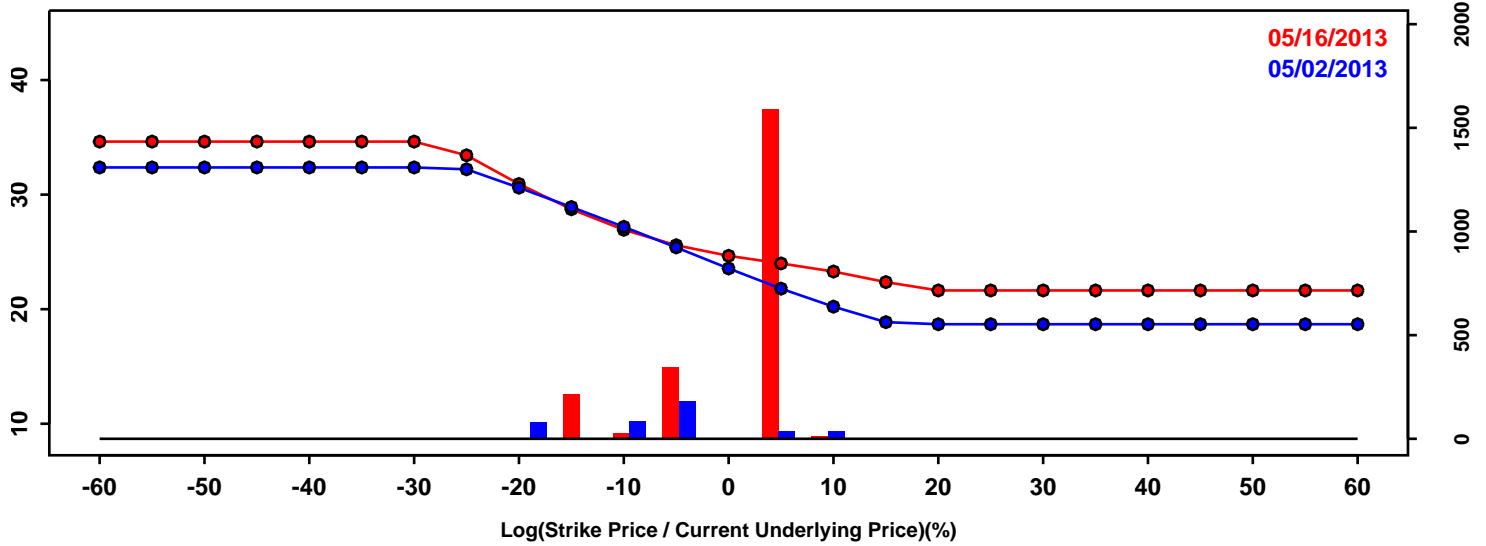


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-16.82%	-15.81%	1.01%
50th Pct	1.39%	0.85%	-0.54%
90th Pct	15.00%	15.08%	0.07%
Mean	0.02%	0.07%	0.05%
Std Dev	13.04%	12.71%	-0.33%
Skew	-0.70	-0.51	0.18
Kurtosis	1.12	1.11	-0.02

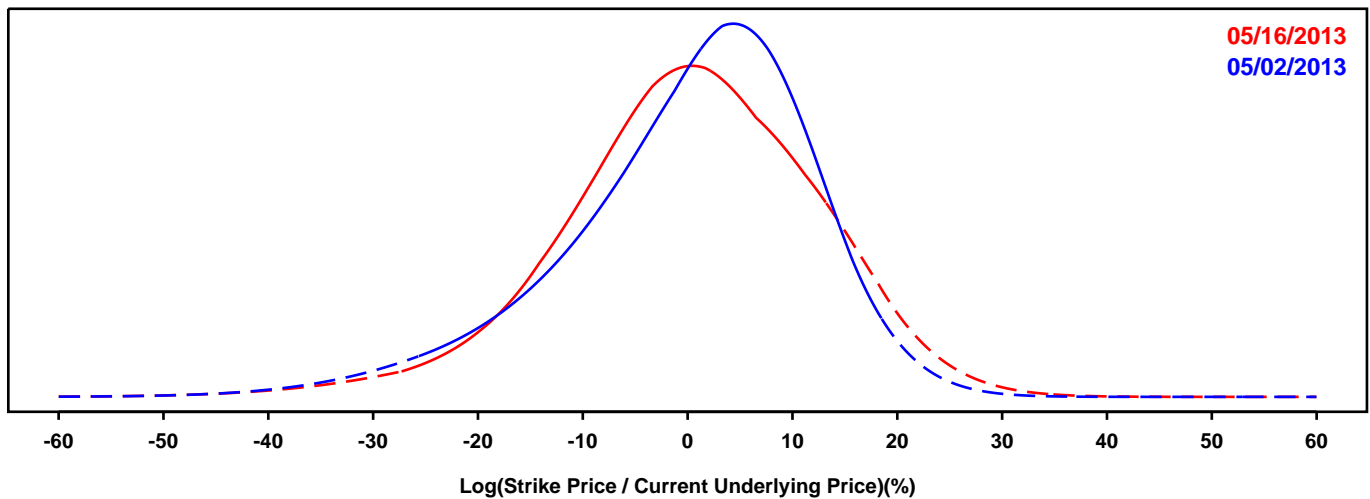
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- CAPITAL ONE

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

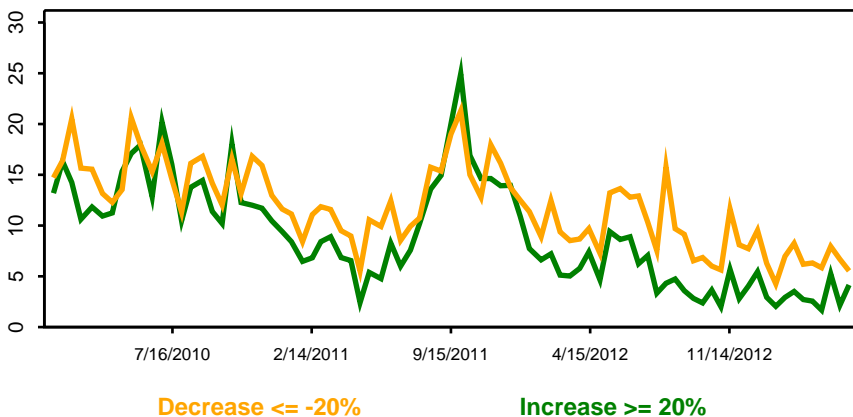
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

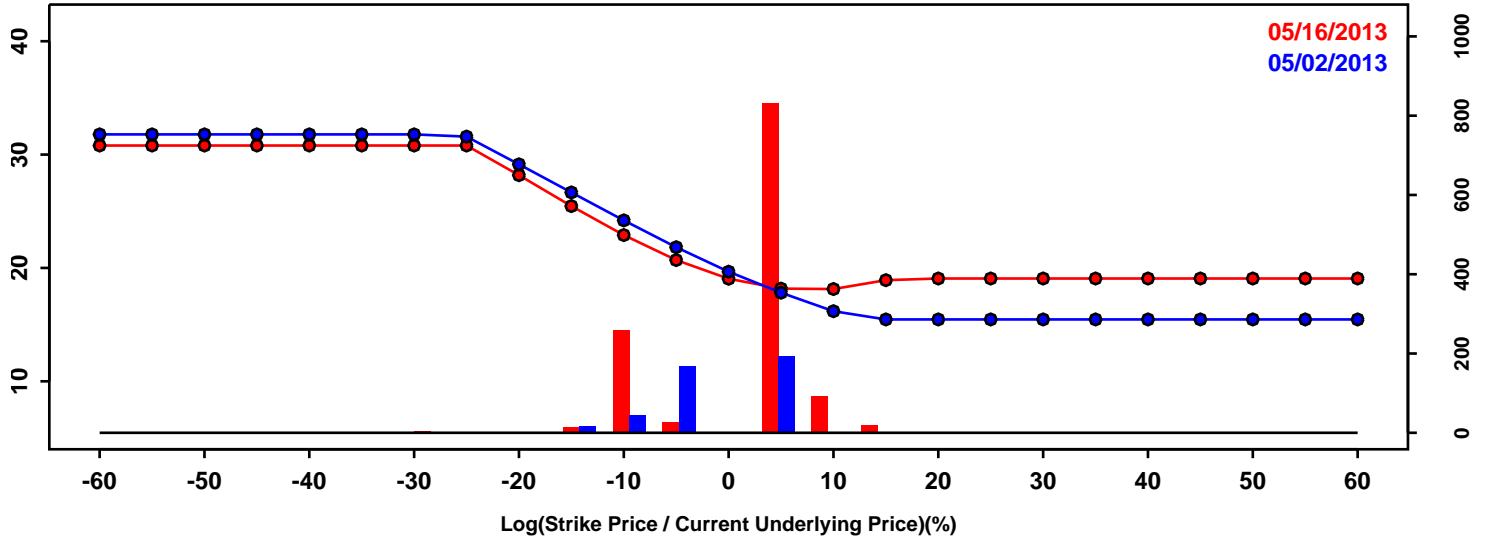


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-16.15%	-15.20%	0.94%
50th Pct	1.72%	0.64%	-1.08%
90th Pct	13.57%	15.40%	1.83%
Mean	0.04%	0.19%	0.16%
Std Dev	12.01%	12.33%	0.32%
Skew	-0.76	-0.43	0.33
Kurtosis	0.91	0.73	-0.17

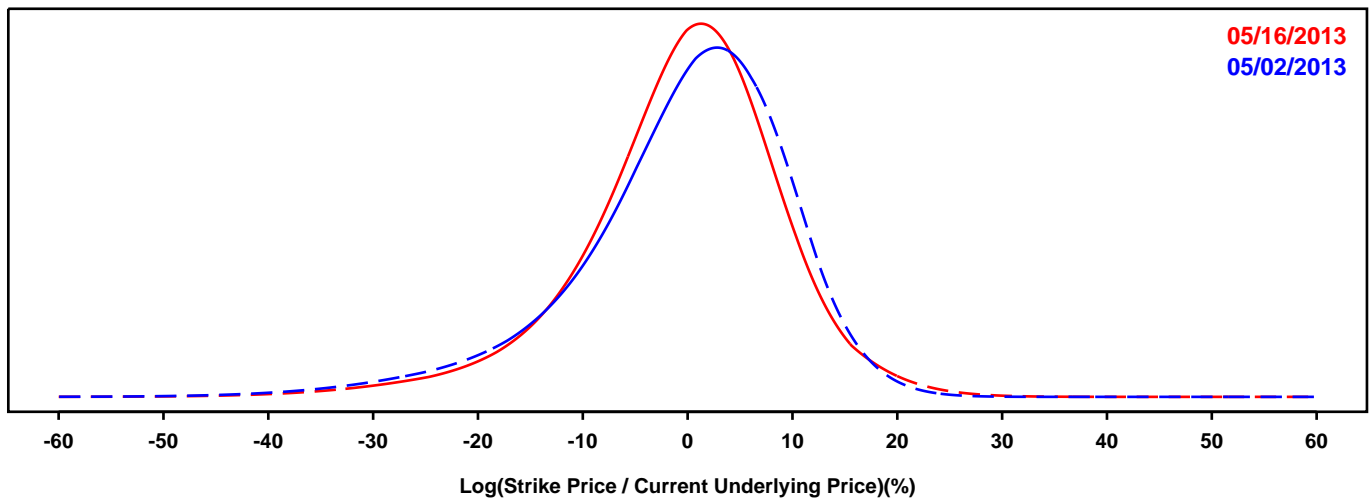
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- FIFTH THIRD

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

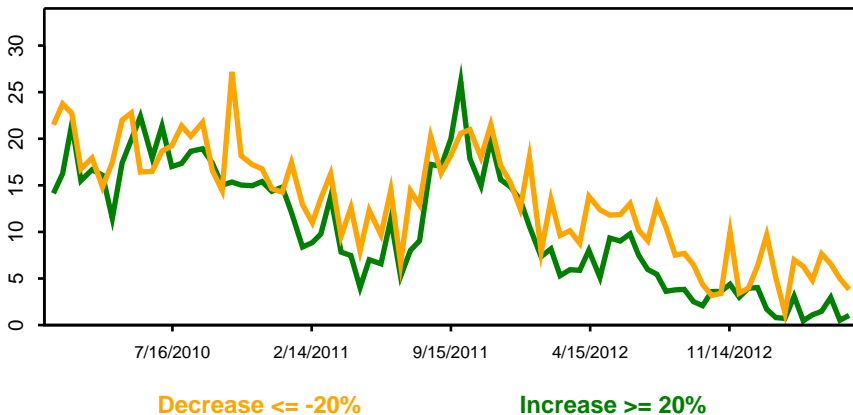
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

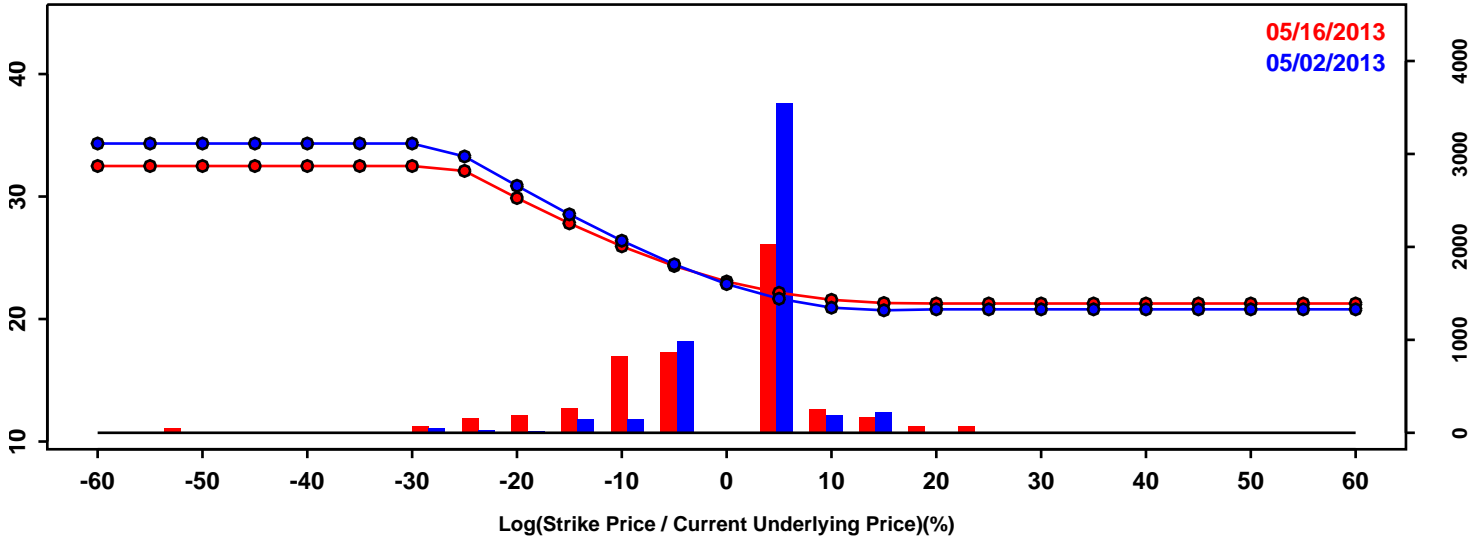


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-13.72%	-12.50%	1.23%
50th Pct	0.95%	0.31%	-0.64%
90th Pct	10.82%	10.34%	-0.47%
Mean	-0.49%	-0.56%	-0.07%
Std Dev	10.28%	9.67%	-0.60%
Skew	-0.98	-0.72	0.26
Kurtosis	1.76	1.77	0.01

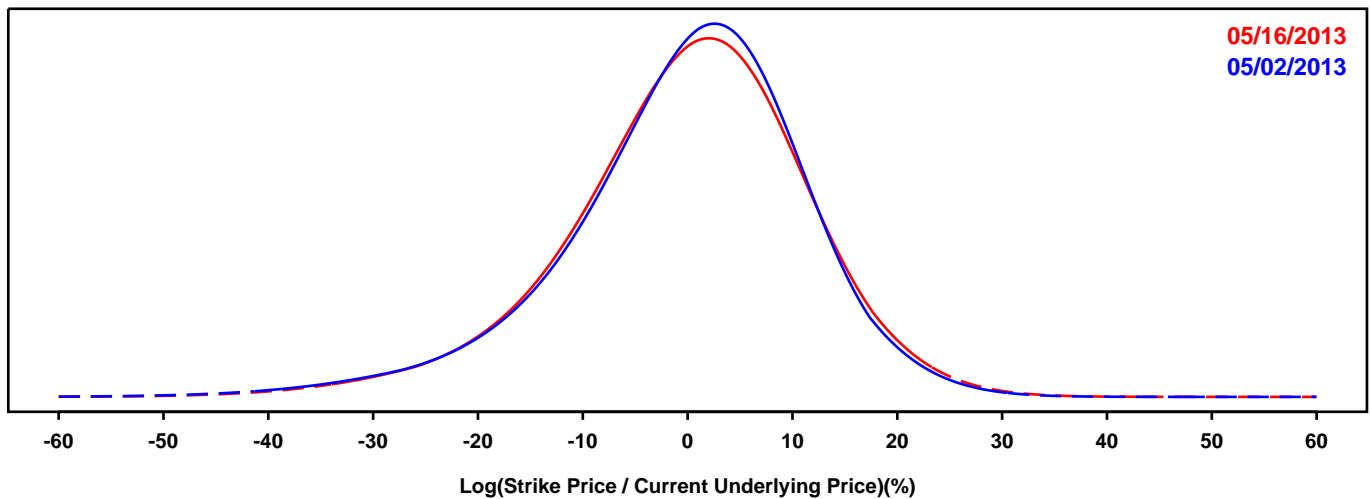
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- GOLDMAN SACHS

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

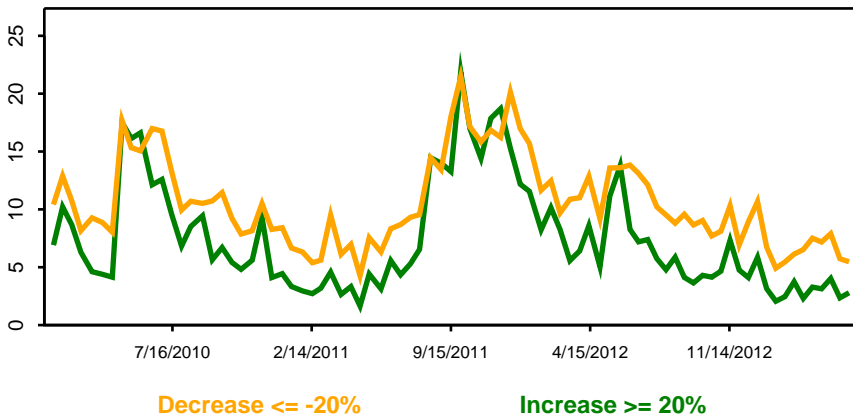
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

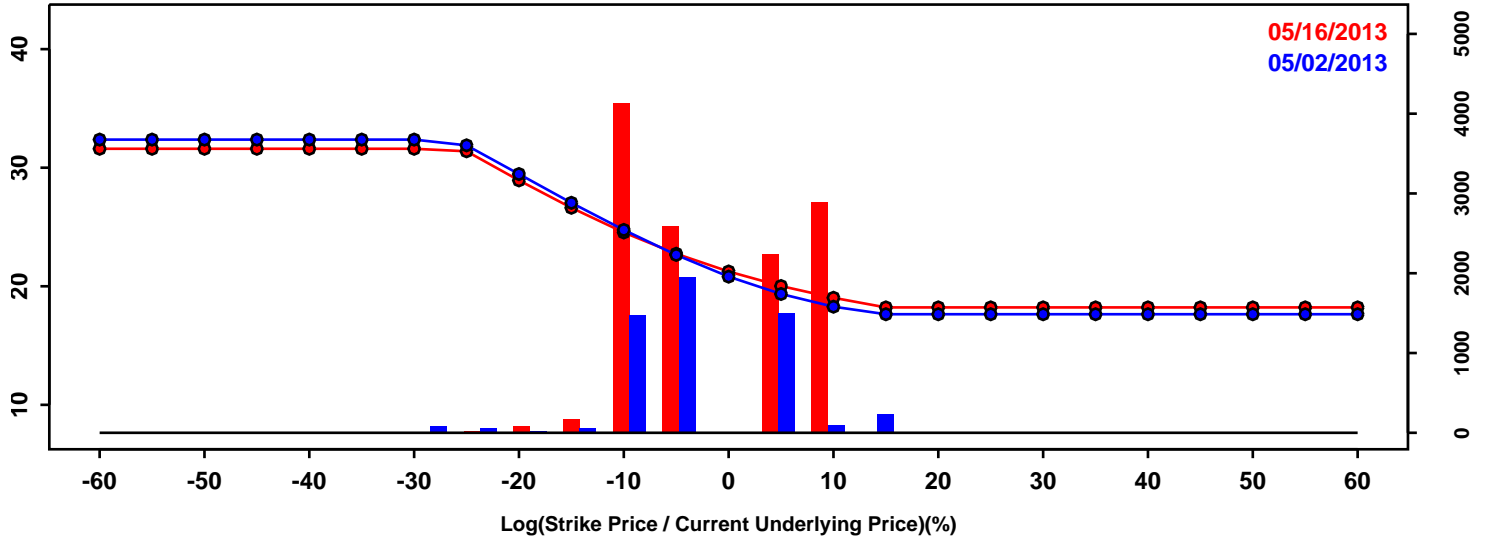


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-14.98%	-14.90%	0.08%
50th Pct	0.86%	0.74%	-0.12%
90th Pct	12.93%	13.48%	0.54%
Mean	-0.26%	-0.14%	0.12%
Std Dev	11.58%	11.60%	0.02%
Skew	-0.70	-0.54	0.16
Kurtosis	1.32	0.96	-0.36

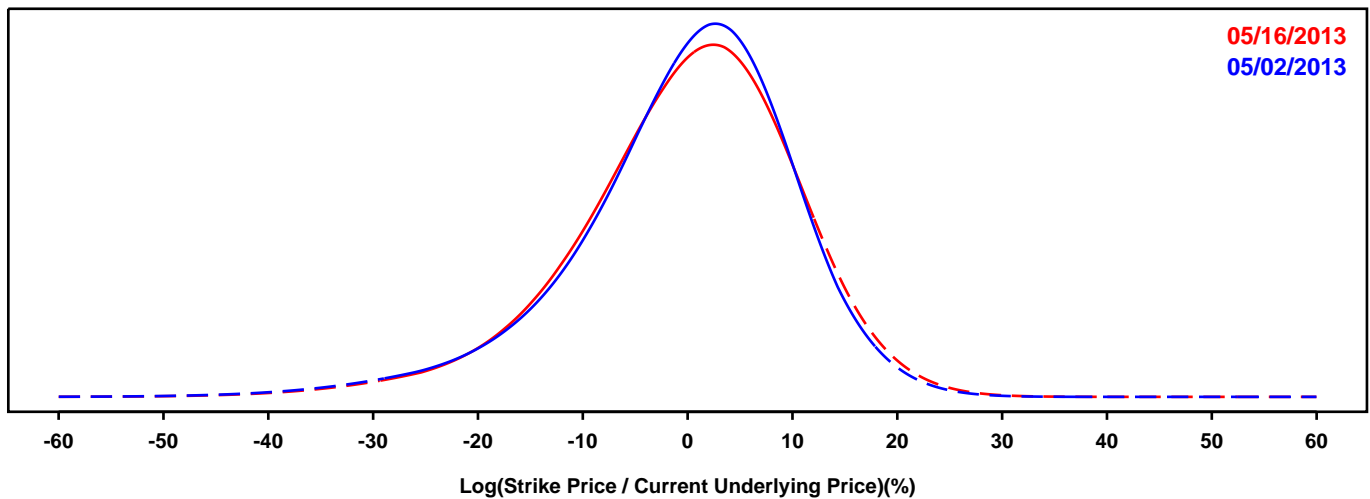
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- JP MORGAN

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

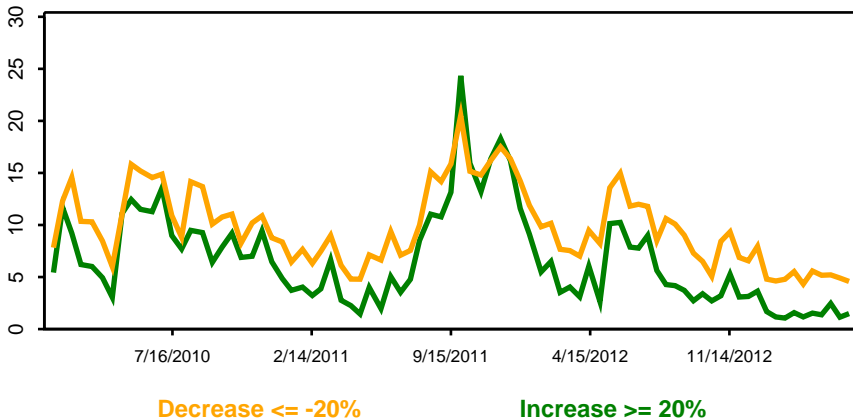
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

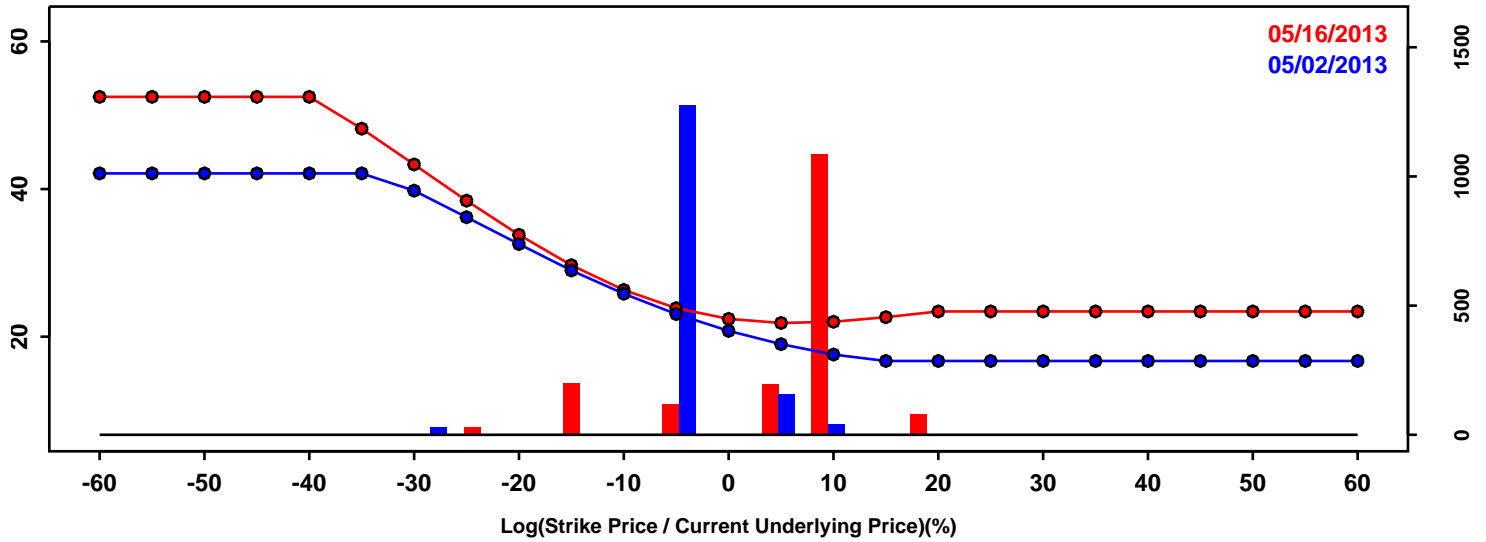


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-13.94%	-13.88%	0.05%
50th Pct	0.86%	0.79%	-0.07%
90th Pct	11.65%	12.29%	0.64%
Mean	-0.36%	-0.19%	0.17%
Std Dev	10.62%	10.71%	0.09%
Skew	-0.81	-0.66	0.15
Kurtosis	1.48	1.12	-0.36

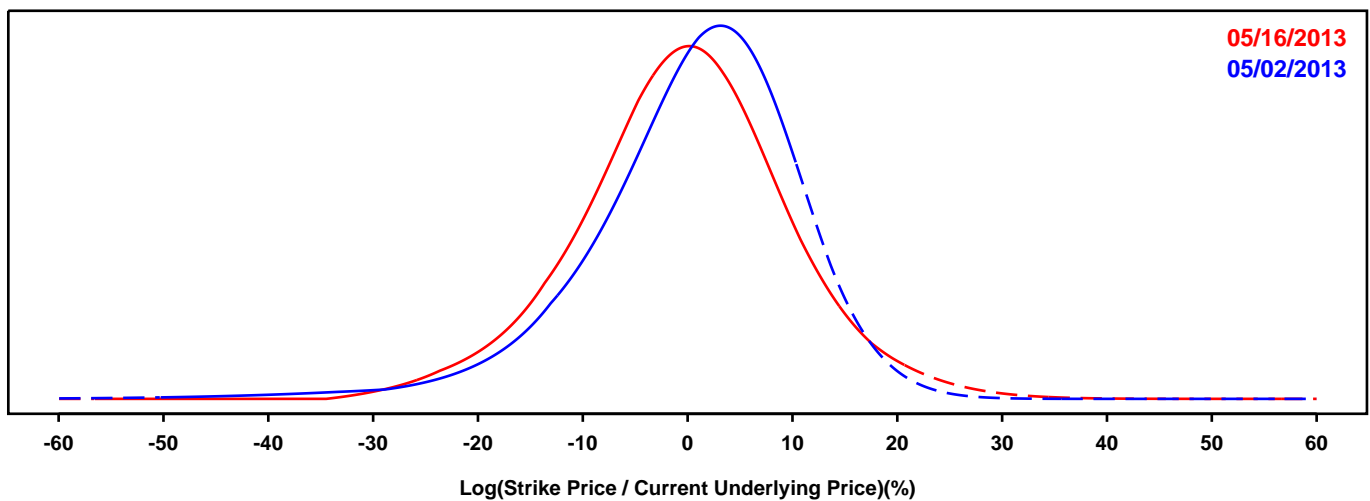
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- KEYCORP

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

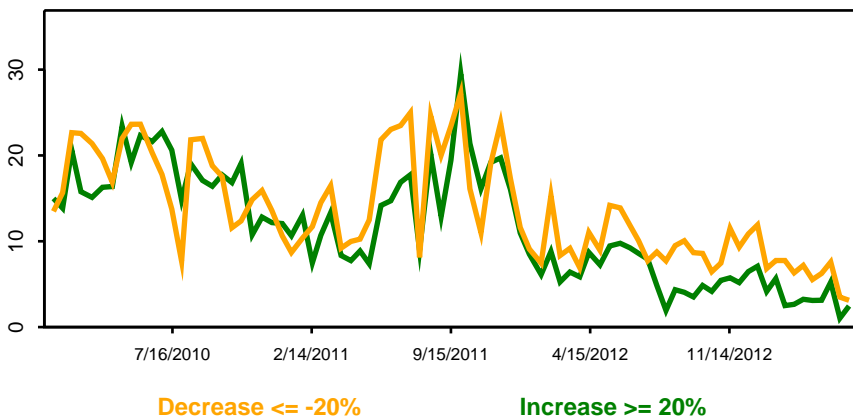
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

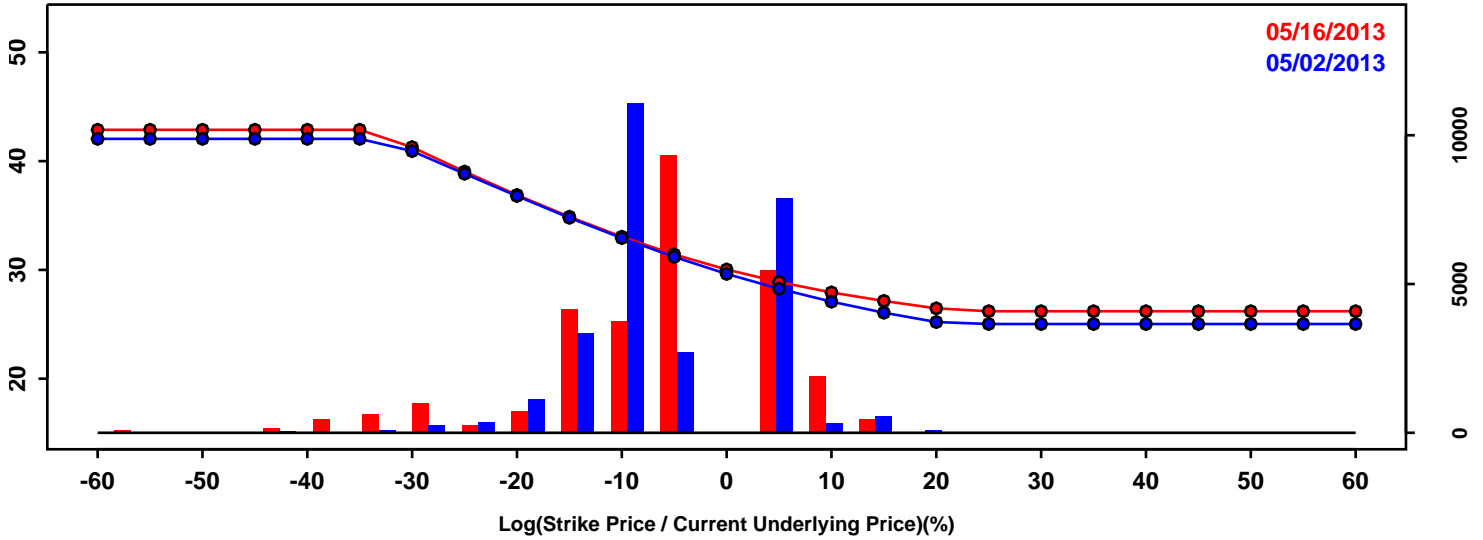


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-11.98%	-13.06%	-1.08%
50th Pct	1.61%	-0.15%	-1.76%
90th Pct	11.94%	12.05%	0.11%
Mean	0.52%	-0.28%	-0.80%
Std Dev	10.21%	10.03%	-0.18%
Skew	-1.04	-0.01	1.03
Kurtosis	2.99	0.39	-2.60

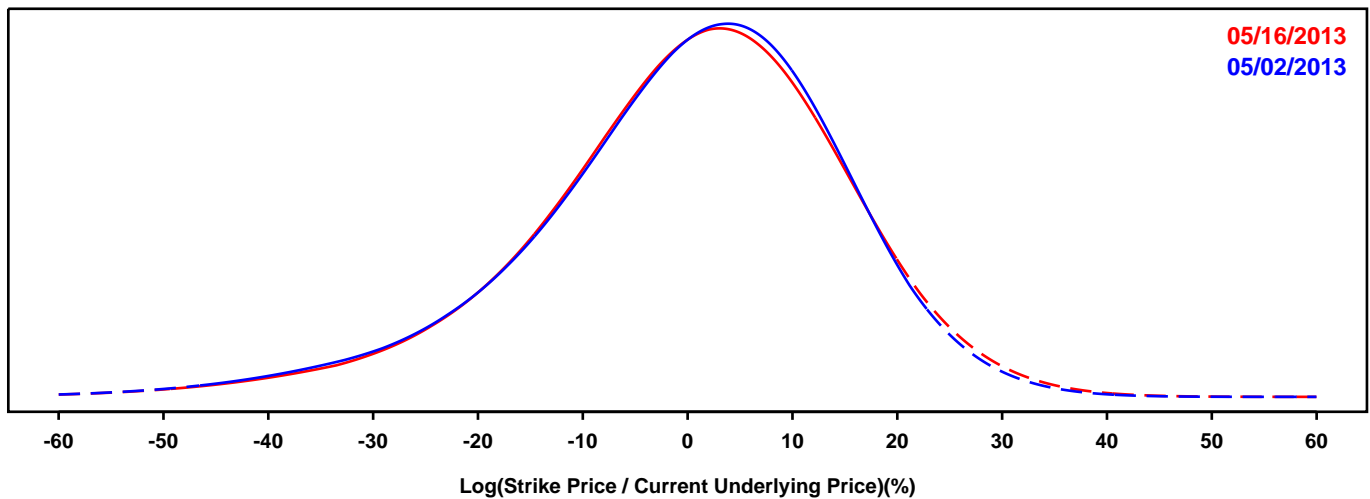
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- MORGAN STANLEY

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

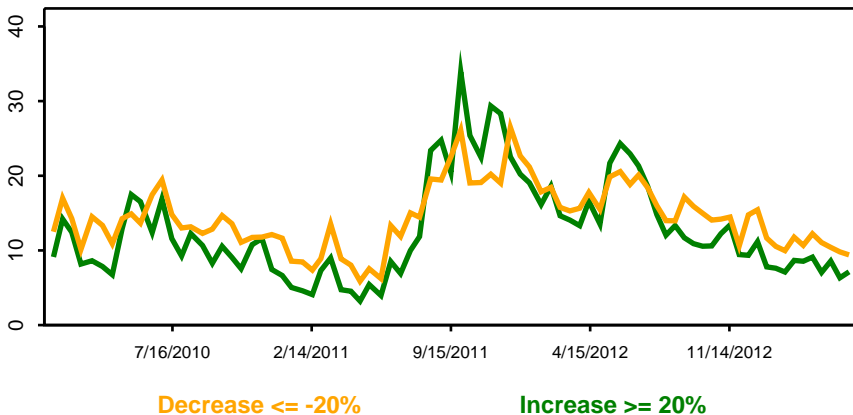
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

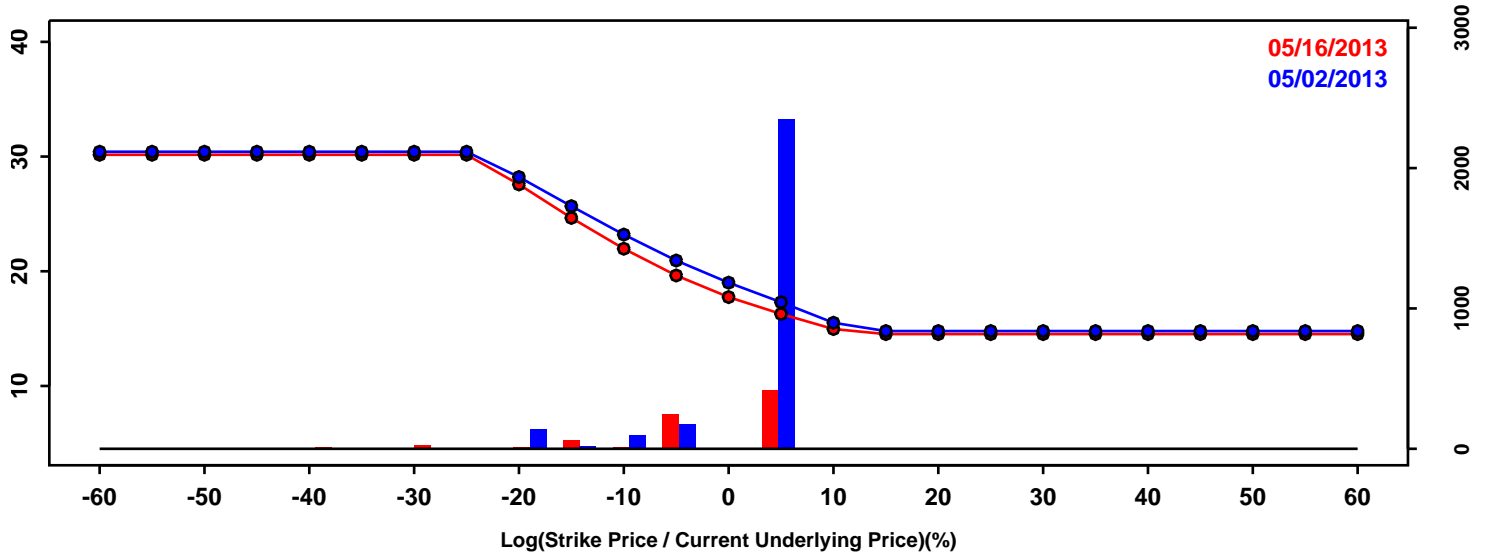


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-19.78%	-19.32%	0.47%
50th Pct	1.29%	1.27%	-0.02%
90th Pct	17.11%	17.71%	0.60%
Mean	-0.26%	0.01%	0.27%
Std Dev	15.05%	15.11%	0.05%
Skew	-0.68	-0.61	0.08
Kurtosis	1.02	1.00	-0.02

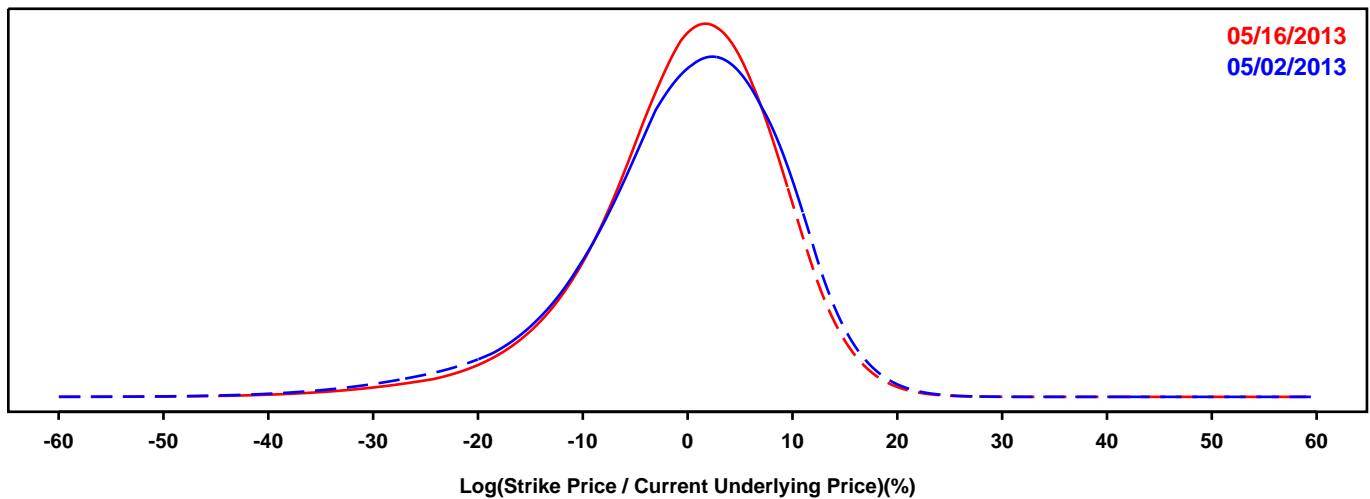
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- PNC FINANCIAL

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

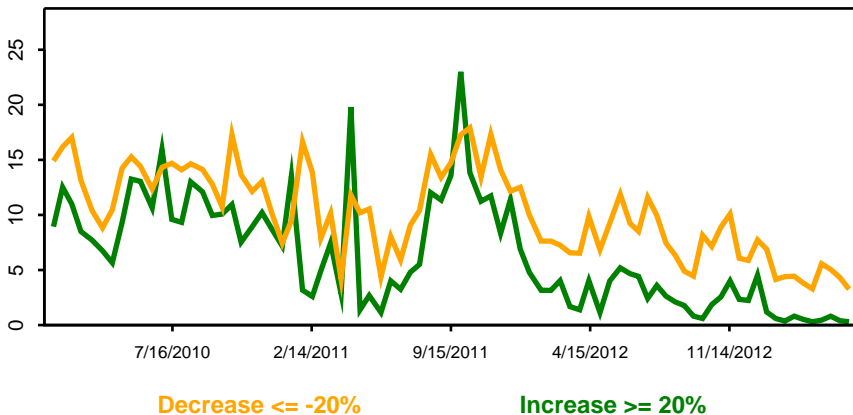
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change



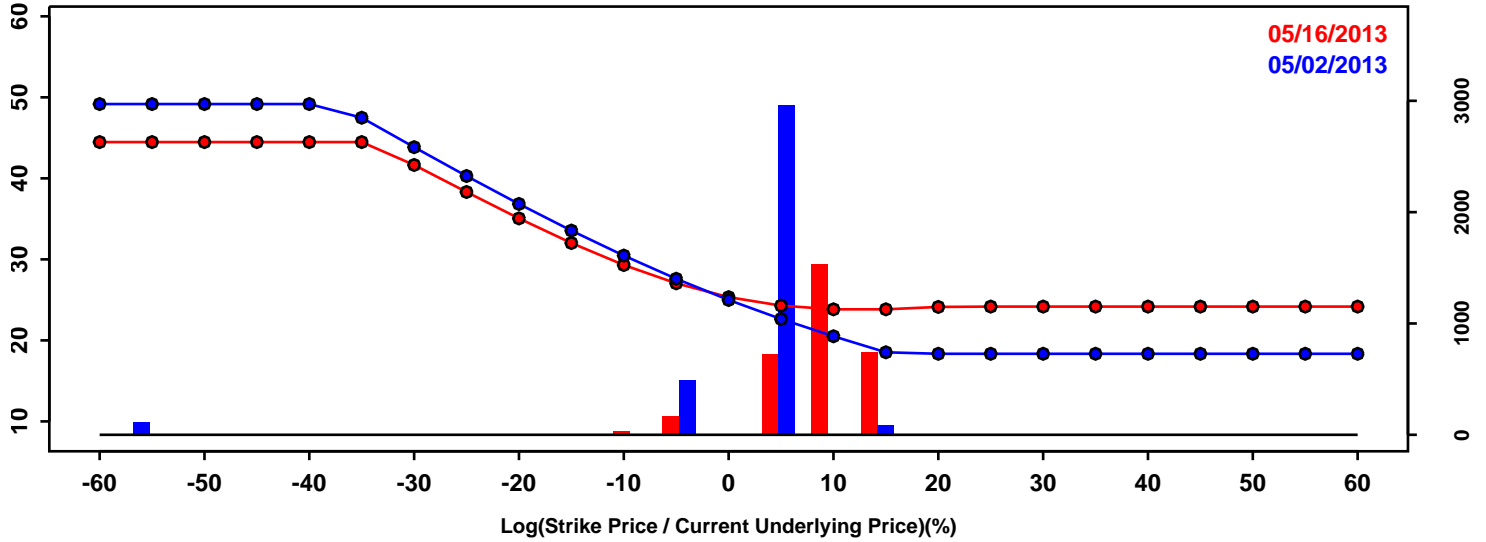
Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-12.96%	-11.79%	1.17%
50th Pct	0.74%	0.62%	-0.12%
90th Pct	10.67%	10.02%	-0.65%
Mean	-0.44%	-0.35%	0.09%
Std Dev	9.86%	9.12%	-0.74%
Skew	-0.91	-0.88	0.03
Kurtosis	1.62	1.81	0.19



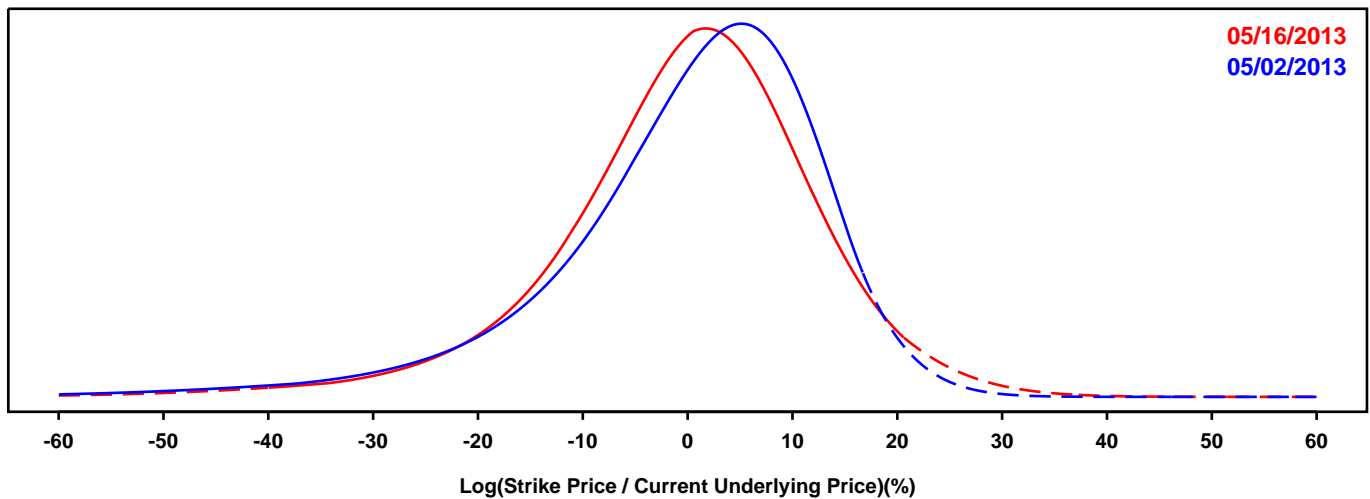
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- REGIONS FINANCIAL

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

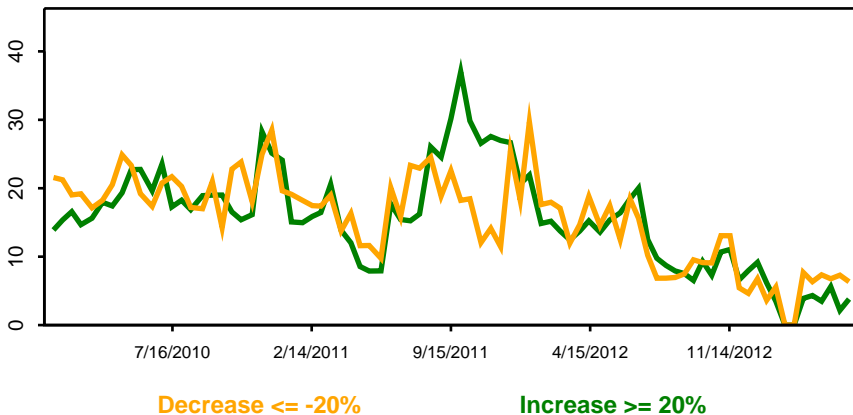
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

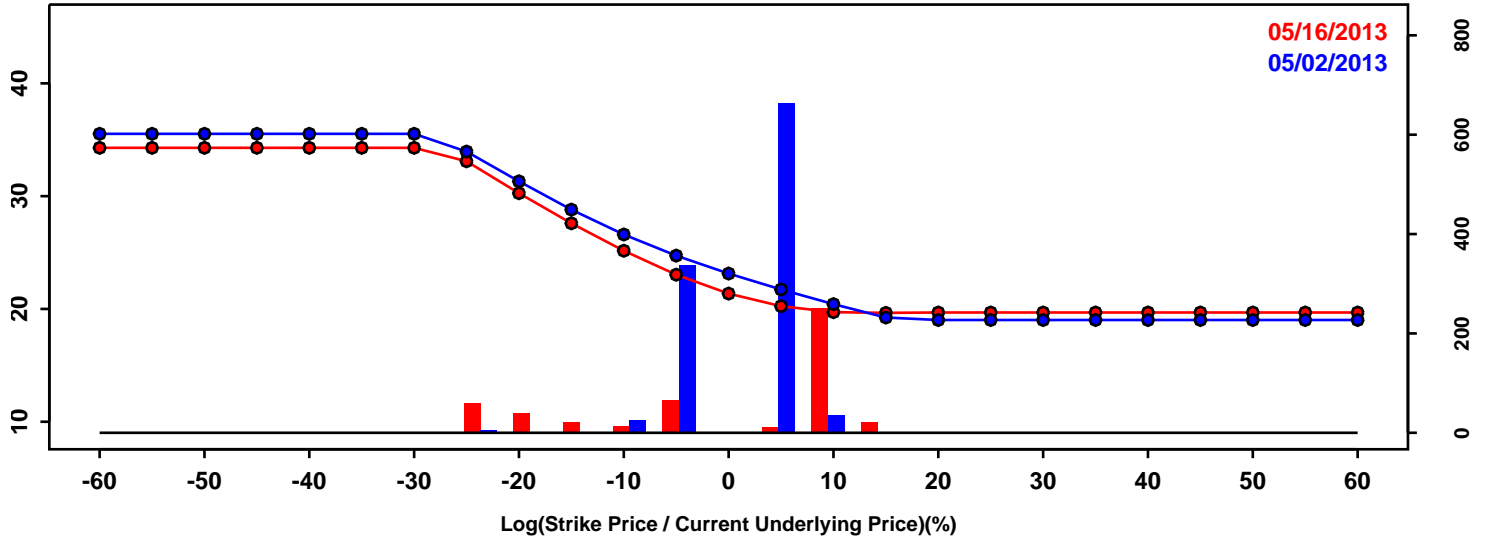


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-16.36%	-15.57%	0.78%
50th Pct	2.13%	0.84%	-1.29%
90th Pct	13.86%	14.28%	0.41%
Mean	-0.01%	-0.17%	-0.17%
Std Dev	13.18%	12.73%	-0.45%
Skew	-1.31	-0.78	0.53
Kurtosis	3.25	2.18	-1.07

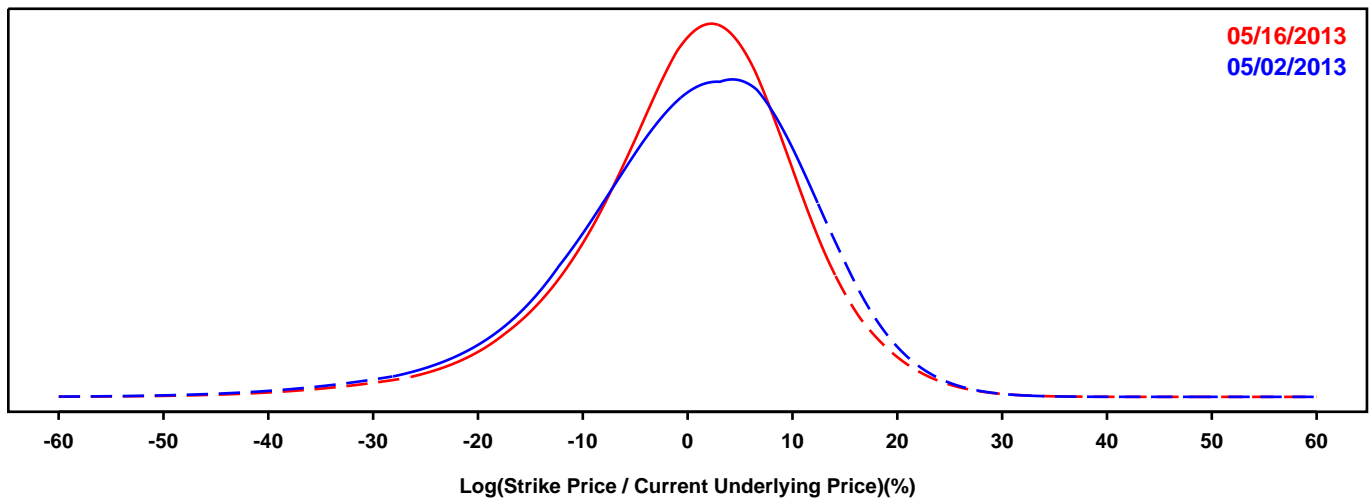
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- SUNTRUST

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

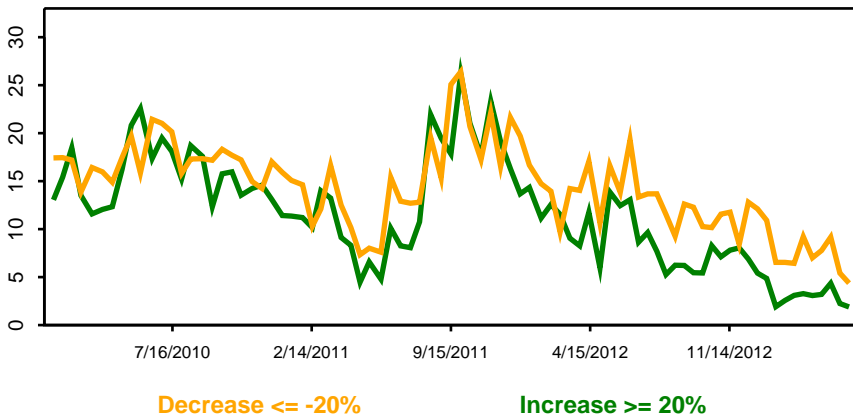
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

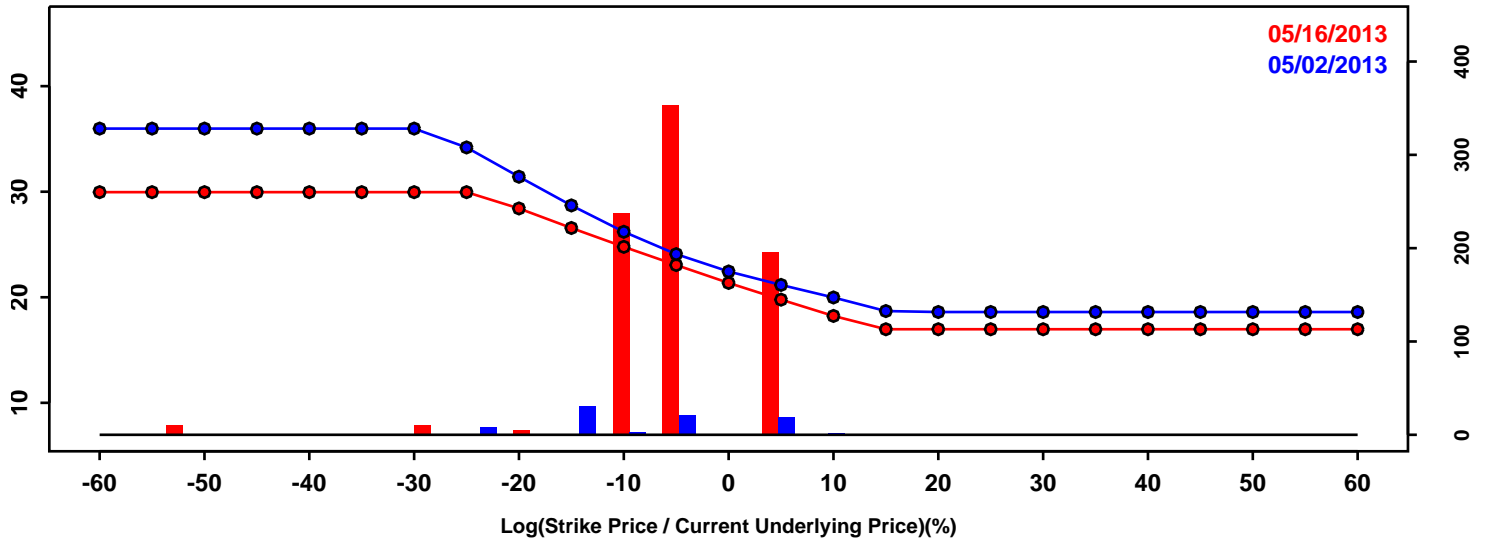


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-14.71%	-13.29%	1.42%
50th Pct	1.20%	1.06%	-0.14%
90th Pct	13.53%	12.34%	-1.19%
Mean	0.08%	0.11%	0.03%
Std Dev	11.64%	10.70%	-0.94%
Skew	-0.73	-0.71	0.02
Kurtosis	1.28	1.60	0.32

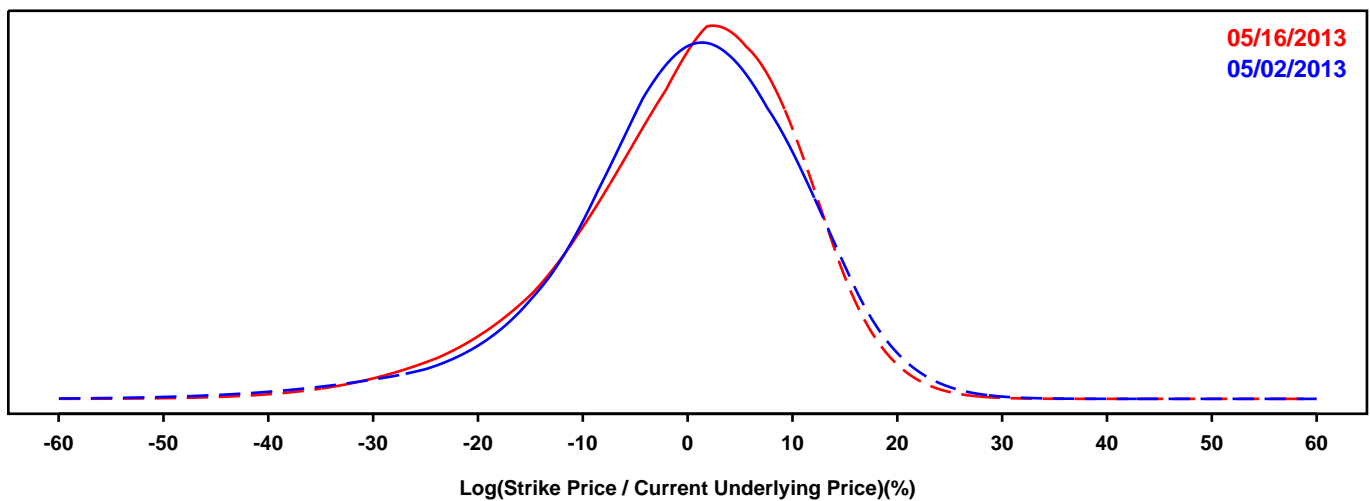
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- STATE STREET

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

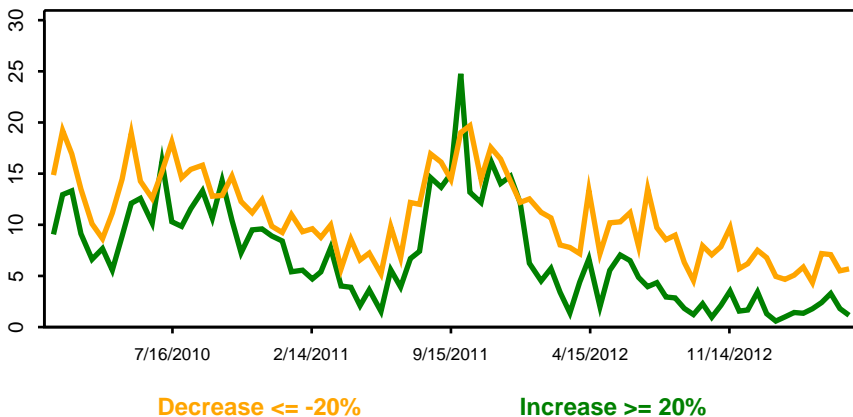
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

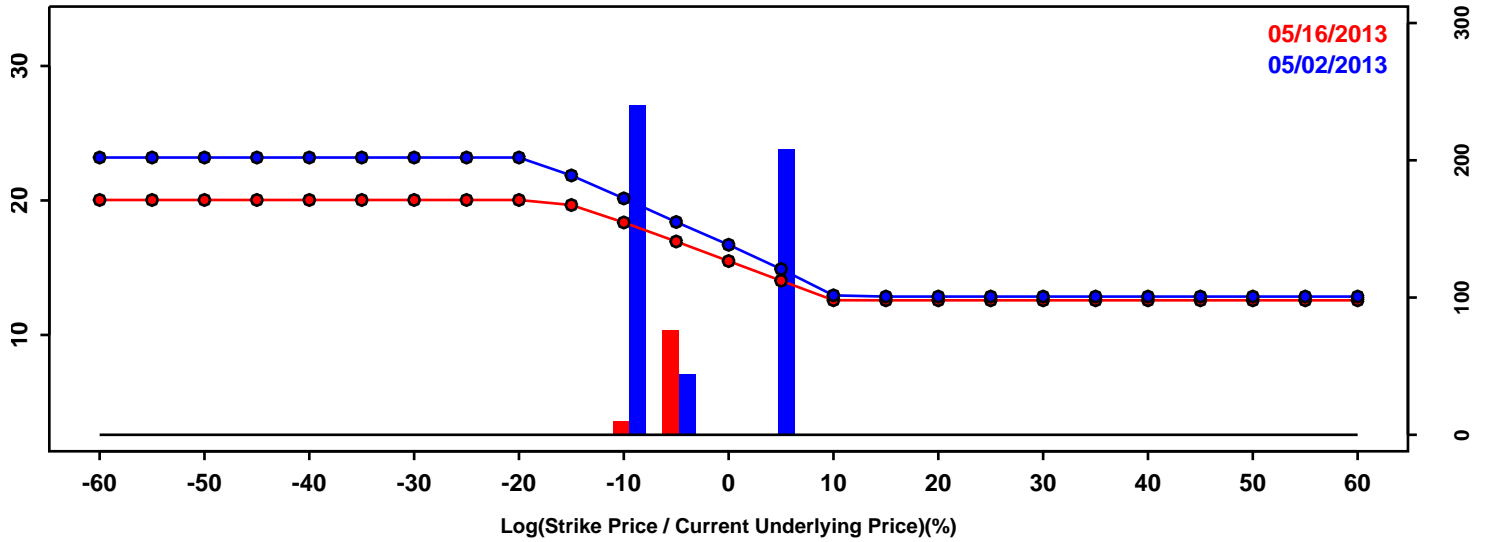


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-14.59%	-15.16%	-0.56%
50th Pct	0.62%	0.98%	0.35%
90th Pct	12.93%	12.25%	-0.68%
Mean	-0.38%	-0.41%	-0.03%
Std Dev	11.47%	11.05%	-0.42%
Skew	-0.79	-0.73	0.06
Kurtosis	1.59	0.87	-0.73

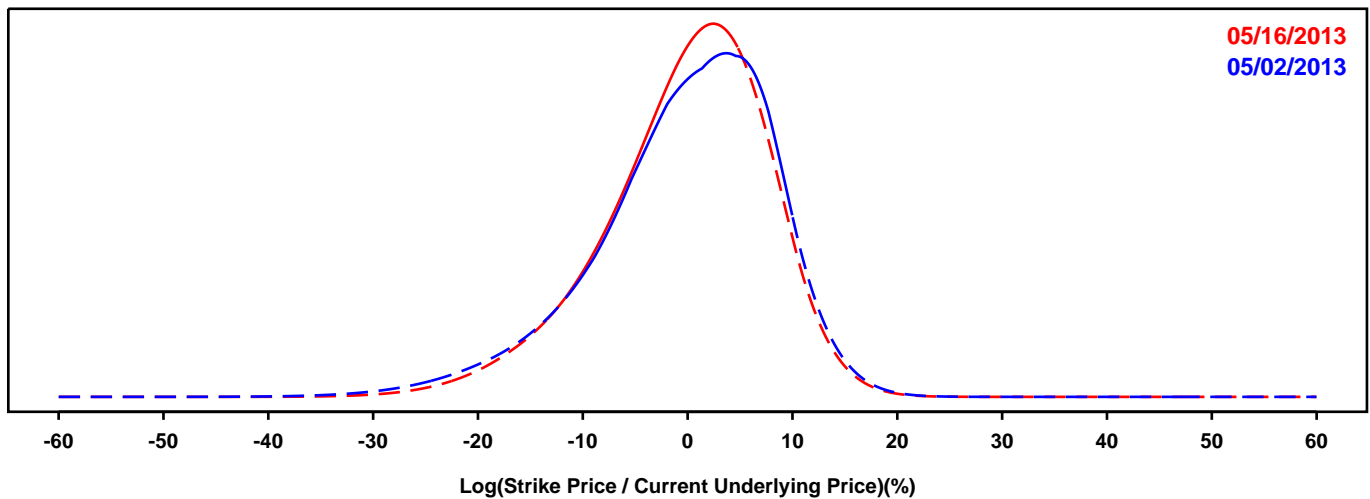
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- US BANCORP

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

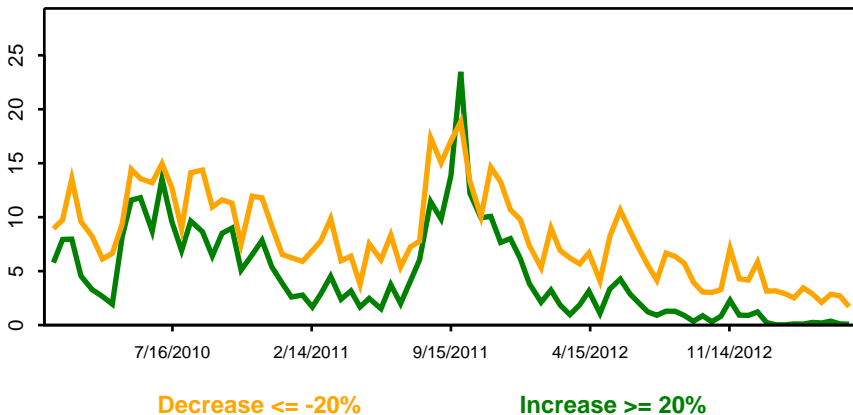
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

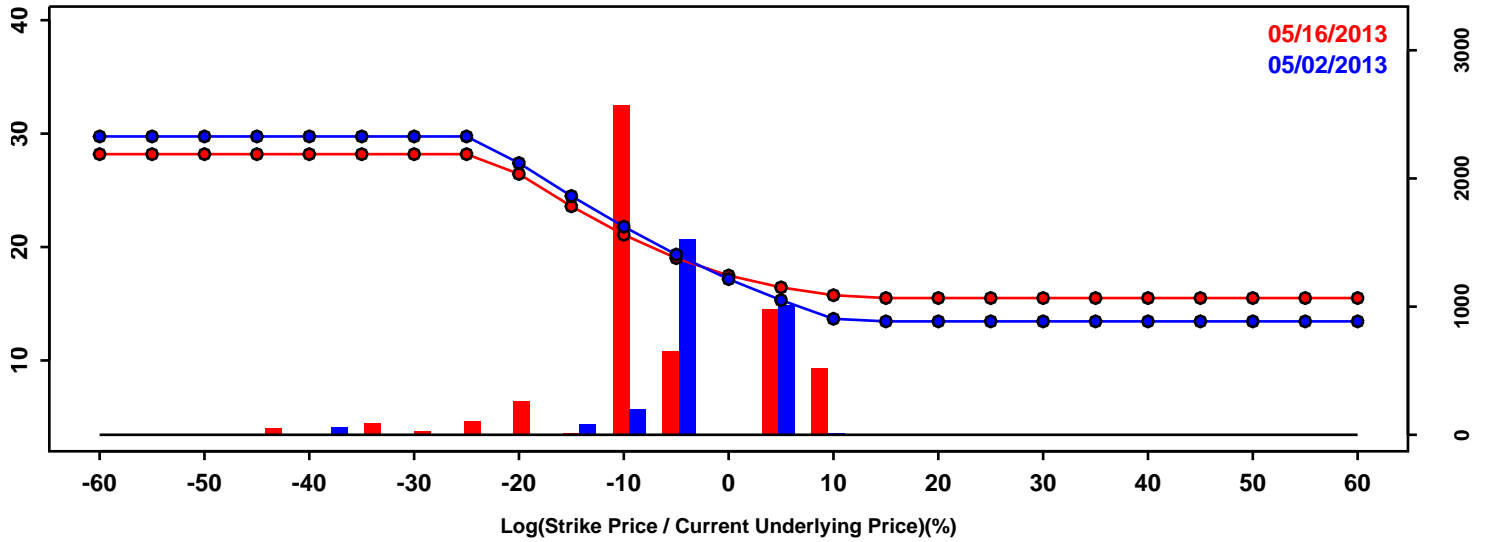


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-11.72%	-10.88%	0.83%
50th Pct	0.82%	0.69%	-0.13%
90th Pct	9.38%	8.94%	-0.44%
Mean	-0.27%	-0.23%	0.04%
Std Dev	8.55%	7.89%	-0.67%
Skew	-0.76	-0.62	0.14
Kurtosis	0.86	0.56	-0.30

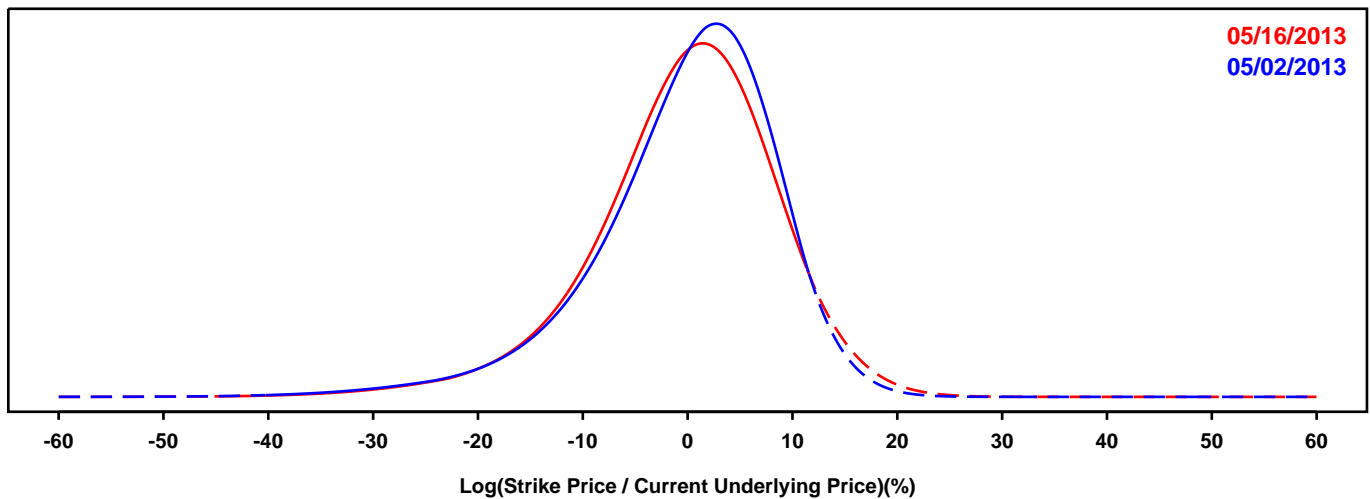
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- WELLS FARGO

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

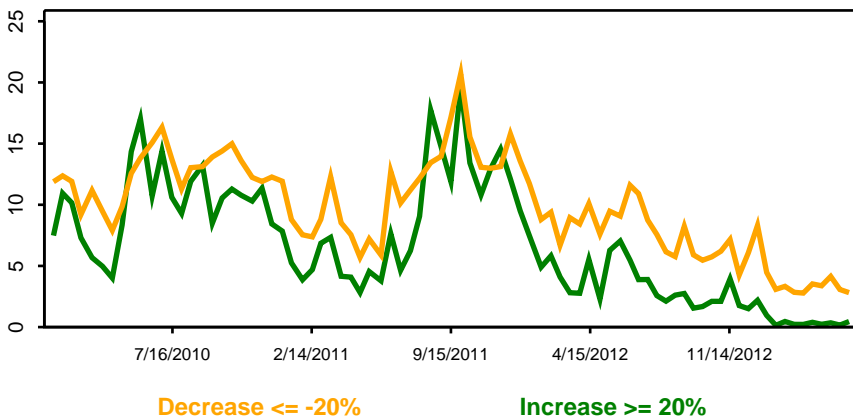
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

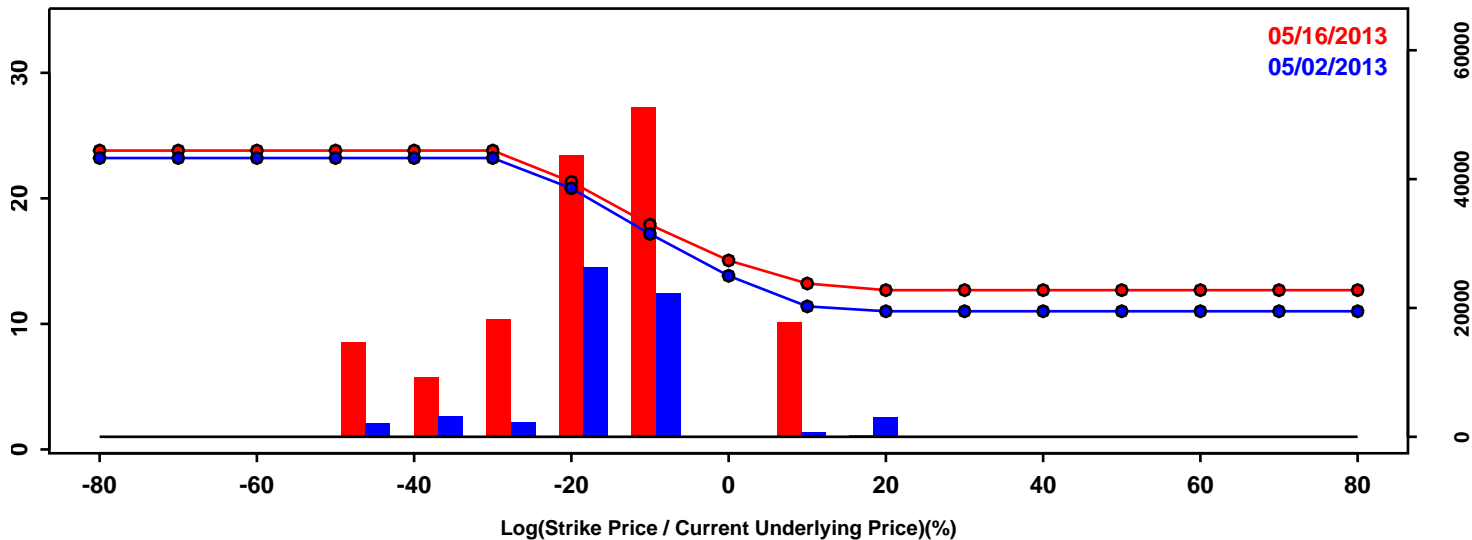


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-11.40%	-11.46%	-0.07%
50th Pct	1.01%	0.48%	-0.53%
90th Pct	9.56%	10.02%	0.46%
Mean	-0.17%	-0.28%	-0.11%
Std Dev	8.82%	8.90%	0.08%
Skew	-0.99	-0.70	0.30
Kurtosis	2.04	1.45	-0.59

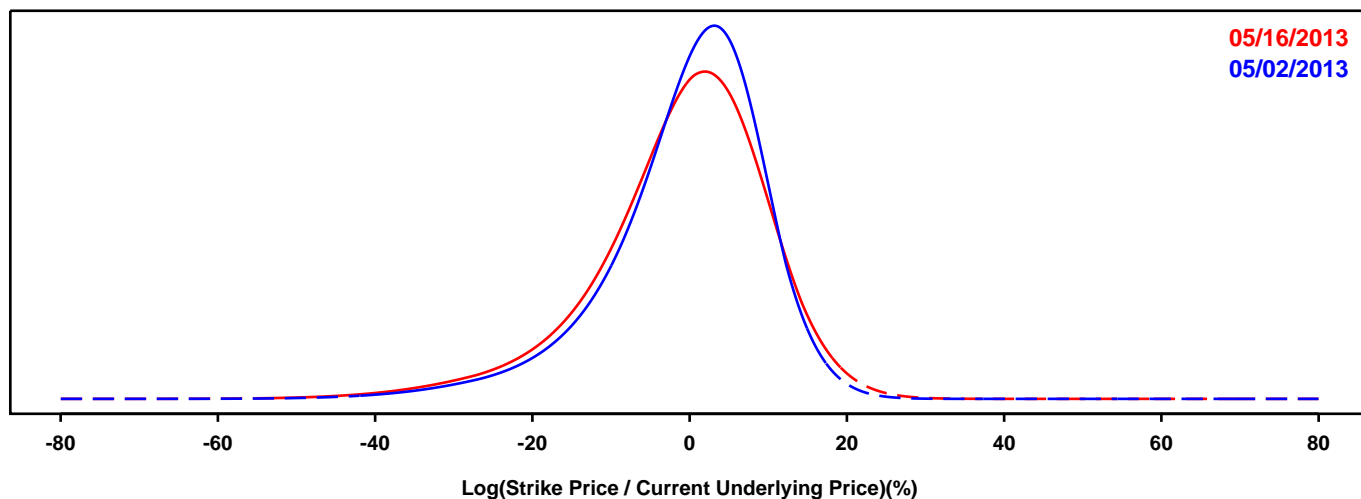
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- S&P 500

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

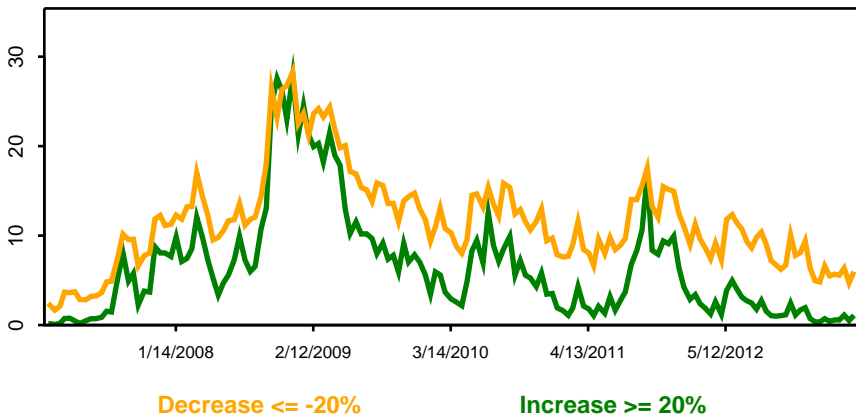
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change



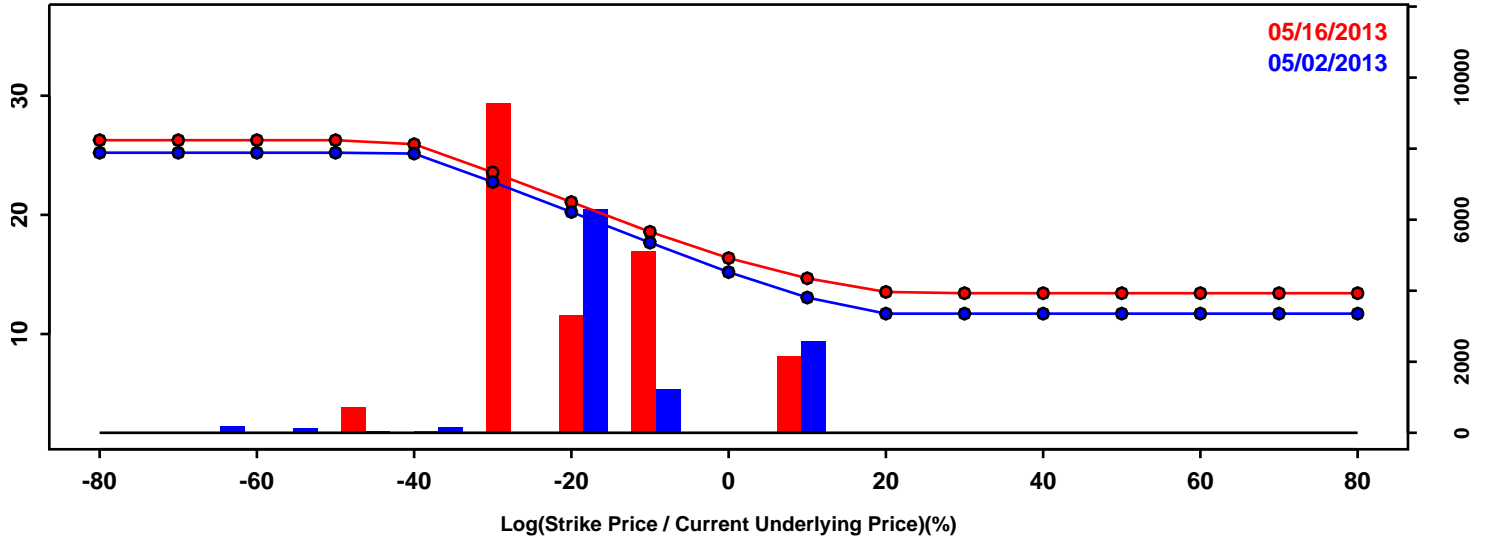
Statistics of the Log Return Distributions

	05/02/2013	05/16/2013	Change
10th Pct	-13.38%	-15.24%	-1.86%
50th Pct	1.02%	0.25%	-0.77%
90th Pct	10.59%	11.38%	0.79%
Mean	-0.43%	-1.08%	-0.65%
Std Dev	10.12%	11.09%	0.97%
Skew	-1.02	-0.86	0.17
Kurtosis	2.00	1.56	-0.44

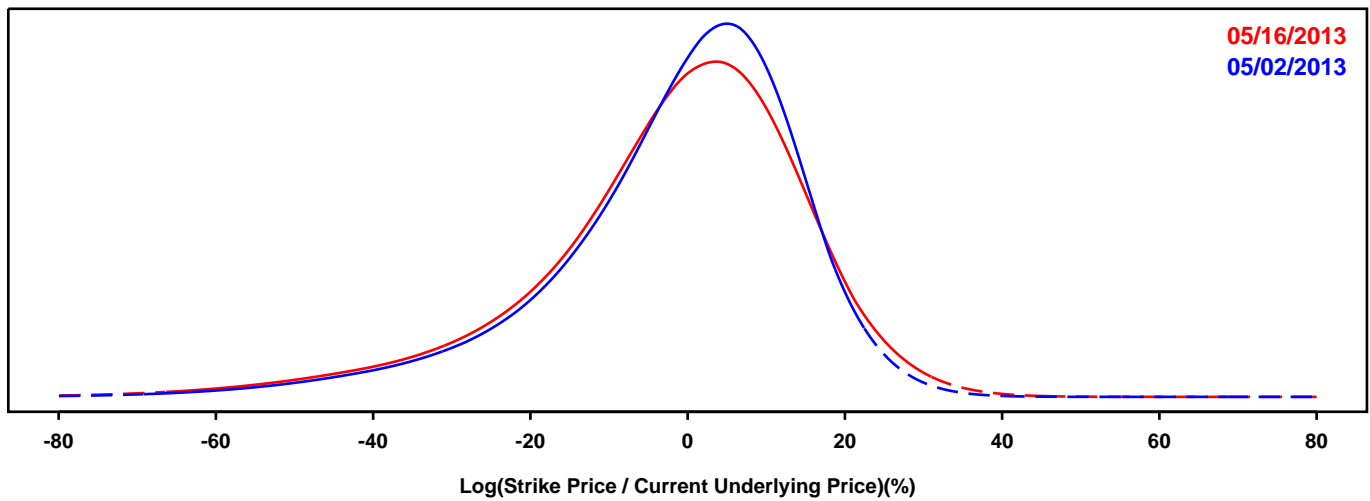
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- S&P 500

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

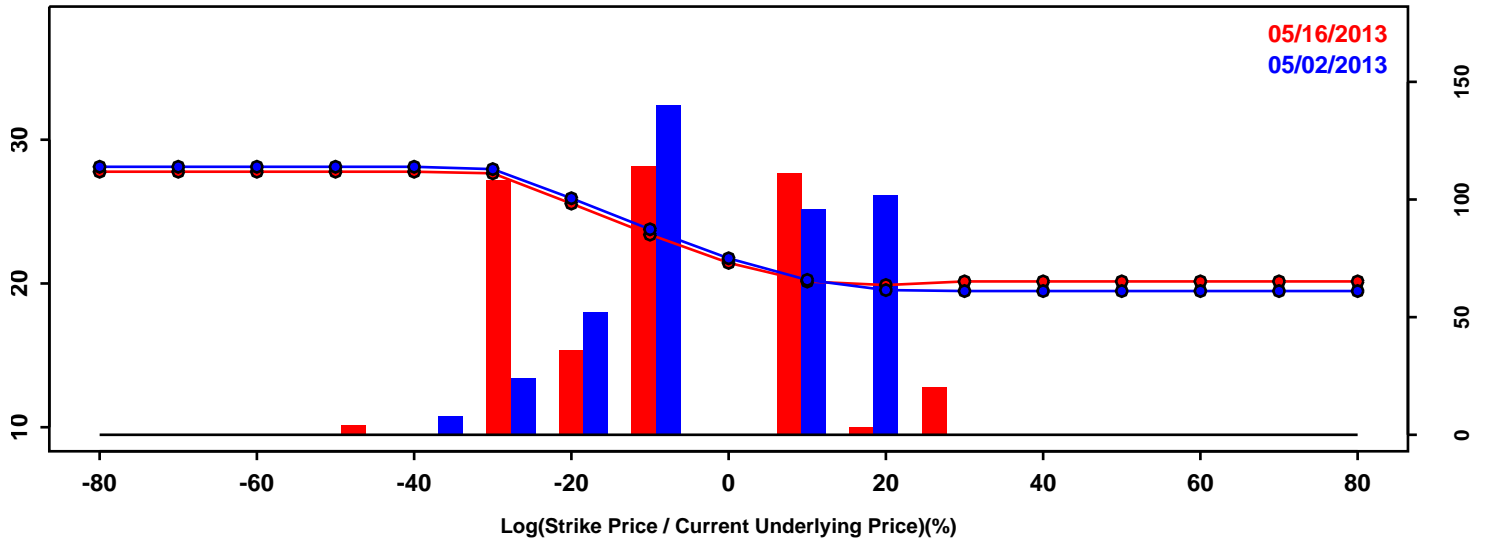


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-22.72%	-24.89%	-2.17%
50th Pct	1.13%	0.26%	-0.88%
90th Pct	15.68%	16.76%	1.09%
Mean	-1.58%	-2.27%	-0.69%
Std Dev	16.17%	17.42%	1.25%
Skew	-1.10	-0.98	0.11
Kurtosis	1.99	1.76	-0.23

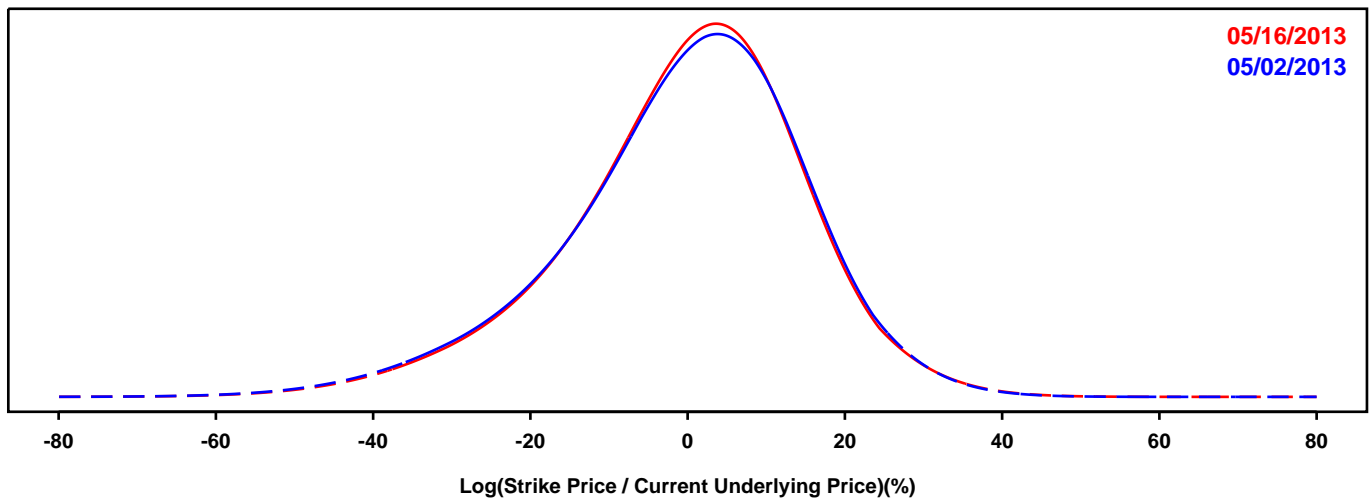
### RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- CRUDE OIL FUTURES (WTI)

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

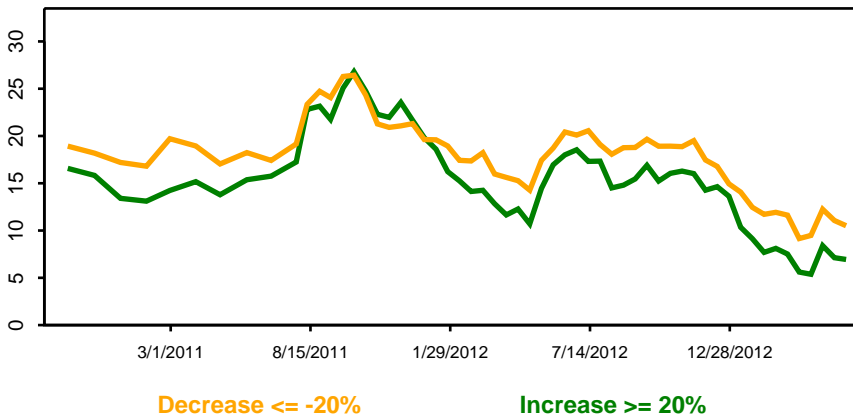
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change



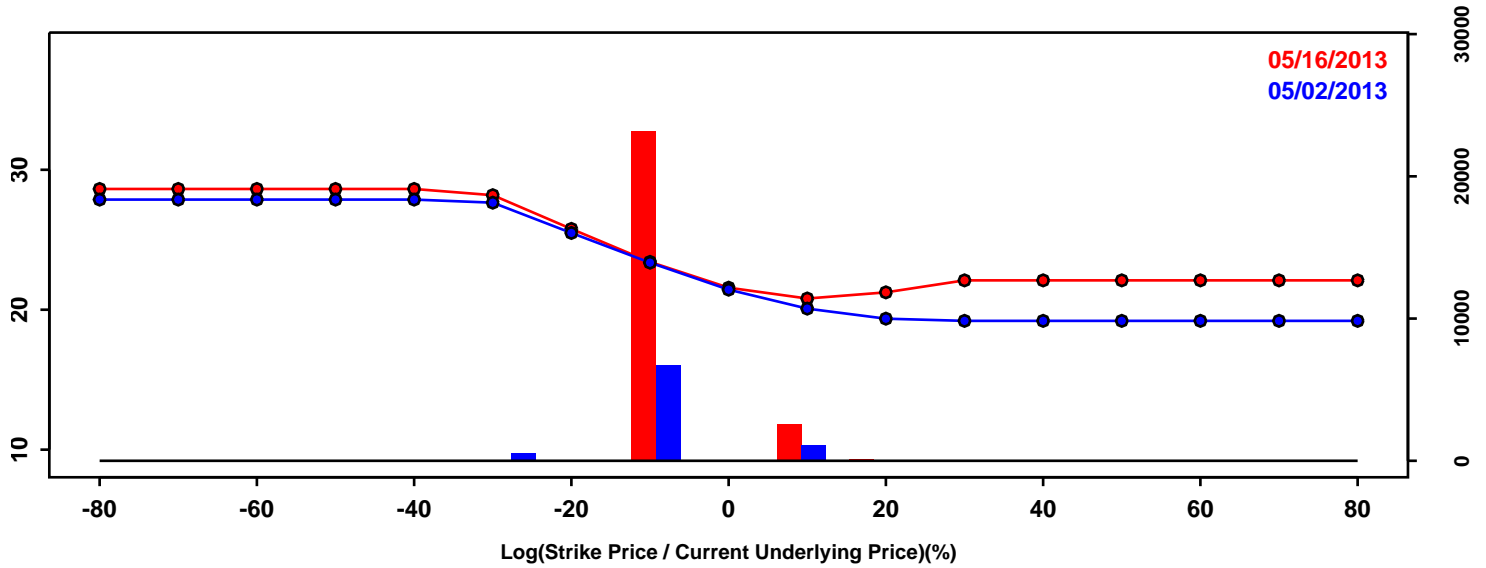
Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-21.28%	-20.58%	0.70%
50th Pct	1.12%	1.12%	0.00%
90th Pct	17.67%	17.44%	-0.23%
Mean	-0.47%	-0.36%	0.12%
Std Dev	15.62%	15.33%	-0.29%
Skew	-0.56	-0.53	0.03
Kurtosis	0.67	0.72	0.05



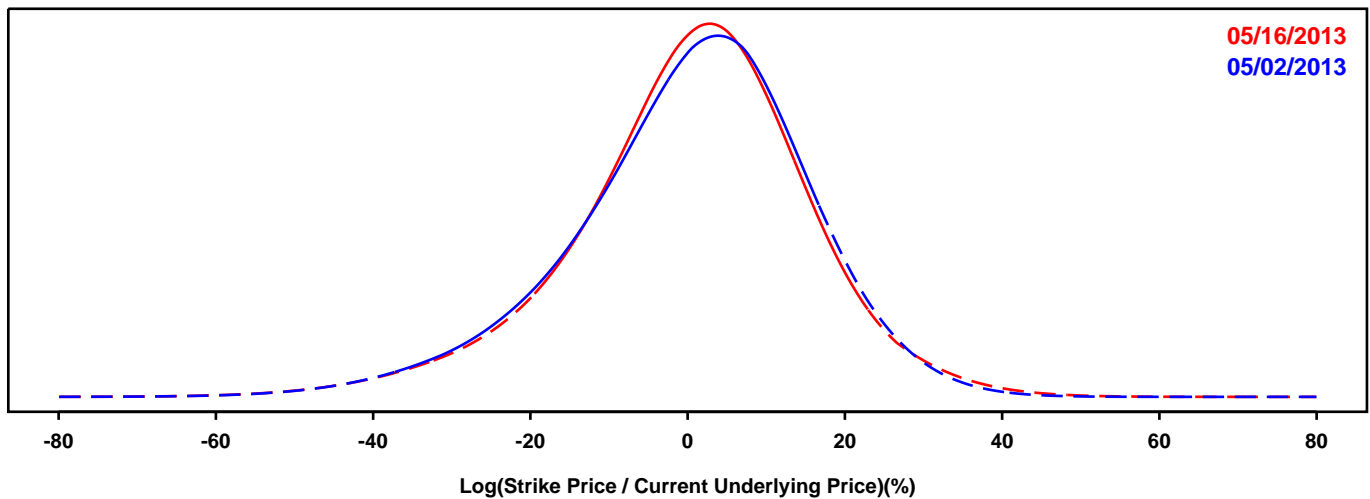
### RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- CRUDE OIL FUTURES (Brent)

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

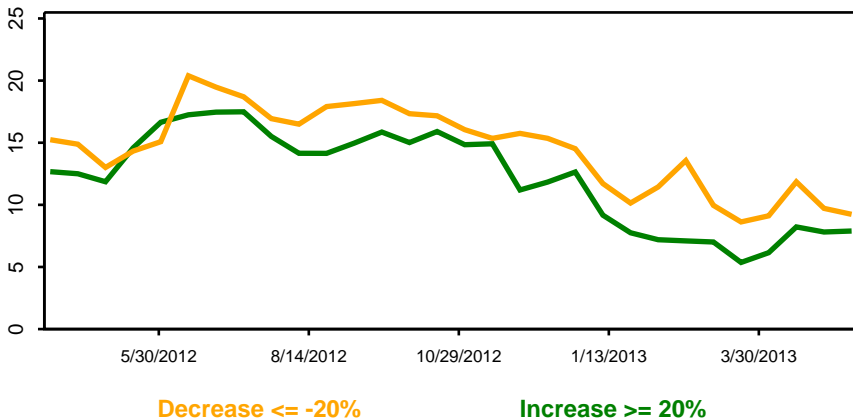
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

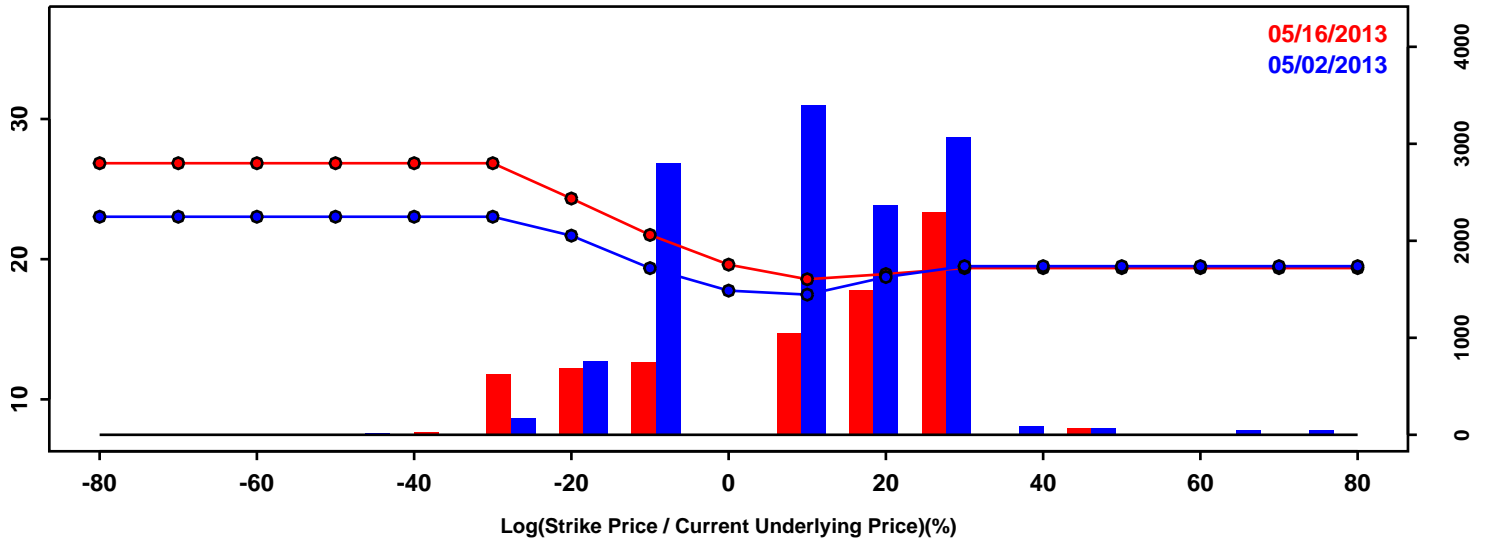


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-19.68%	-19.14%	0.54%
50th Pct	1.61%	1.35%	-0.26%
90th Pct	18.21%	18.11%	-0.11%
Mean	0.29%	0.34%	0.05%
Std Dev	15.22%	15.24%	0.02%
Skew	-0.51	-0.43	0.08
Kurtosis	0.68	0.92	0.24

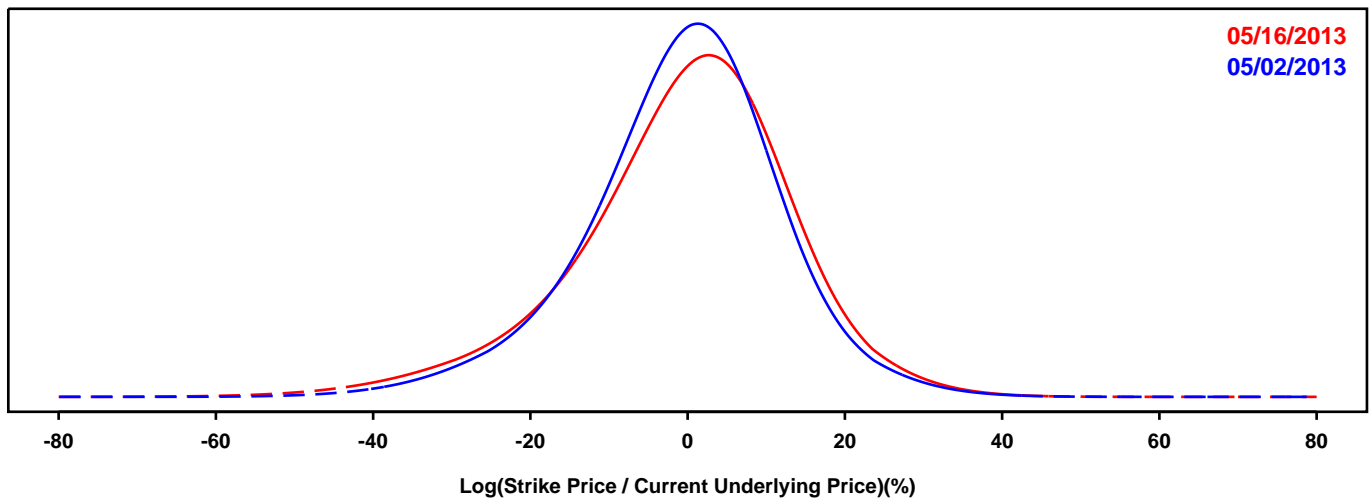
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- GOLD FUTURES

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

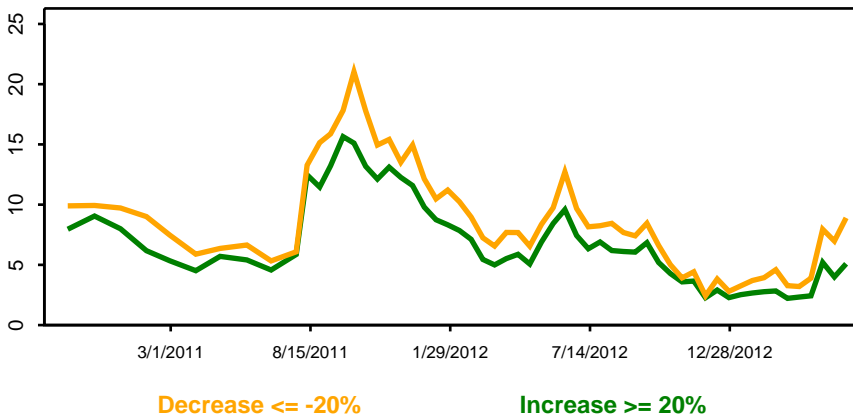
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

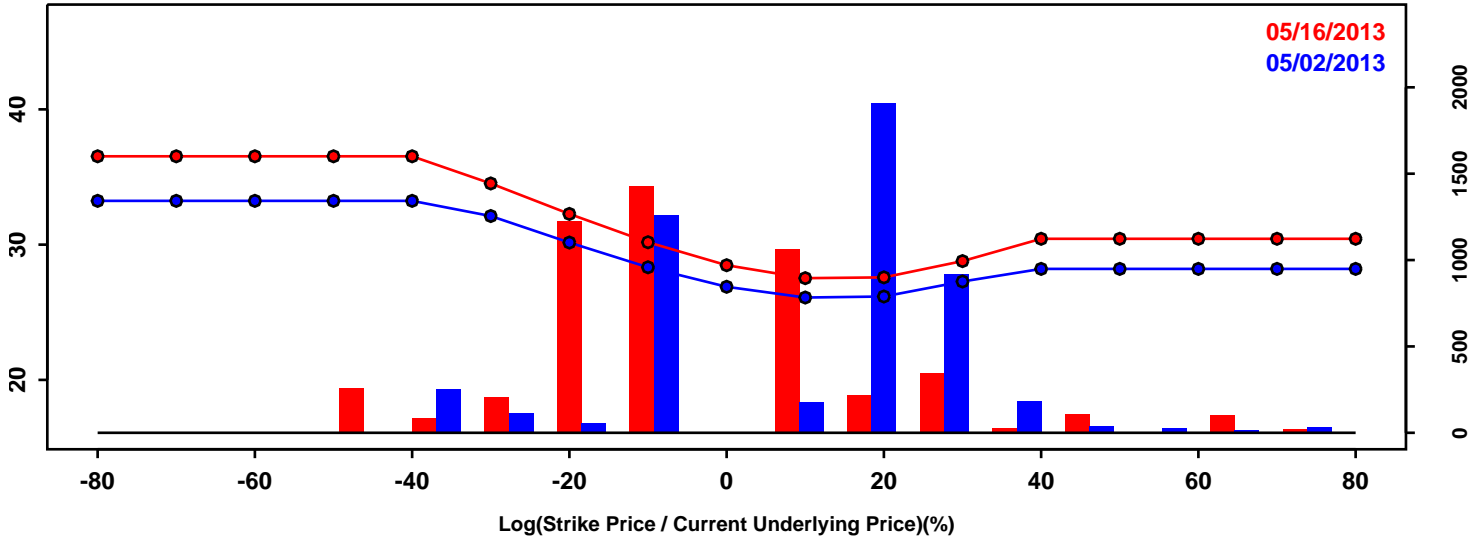


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-16.74%	-18.71%	-1.97%
50th Pct	0.09%	0.74%	0.66%
90th Pct	14.10%	15.58%	1.49%
Mean	-0.66%	-0.56%	0.10%
Std Dev	12.63%	14.06%	1.43%
Skew	-0.36	-0.56	-0.20
Kurtosis	0.87	1.01	0.14

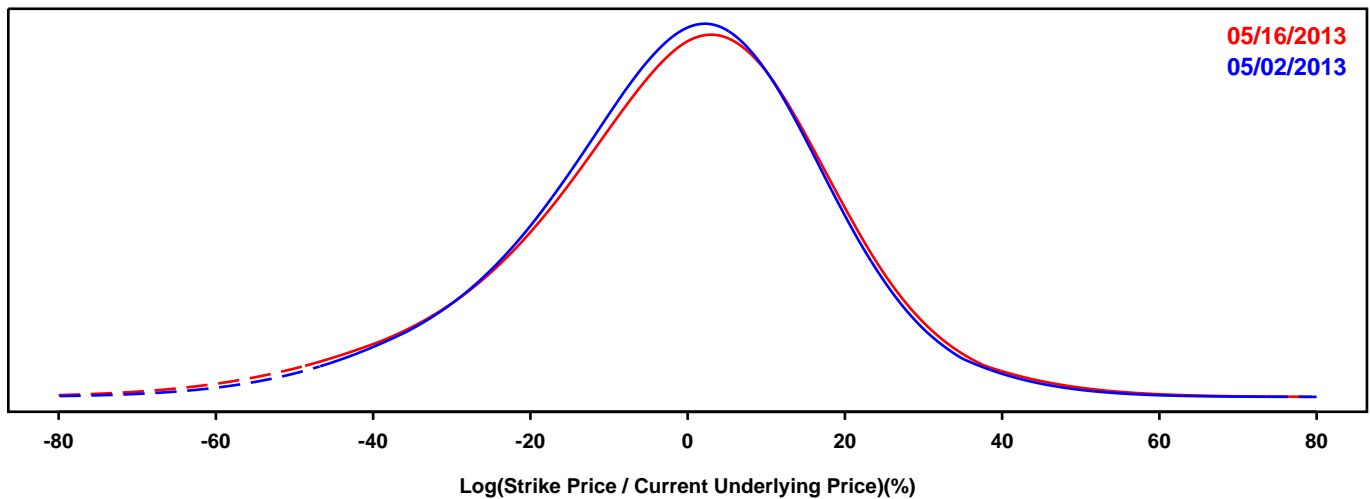
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- SILVER FUTURES

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

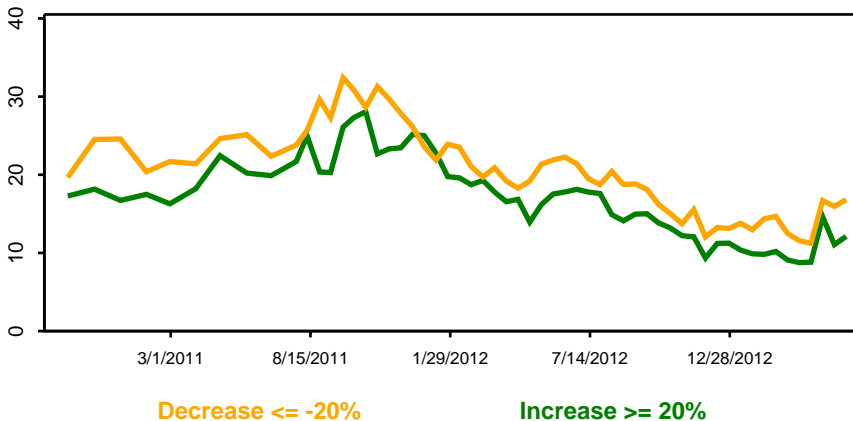
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

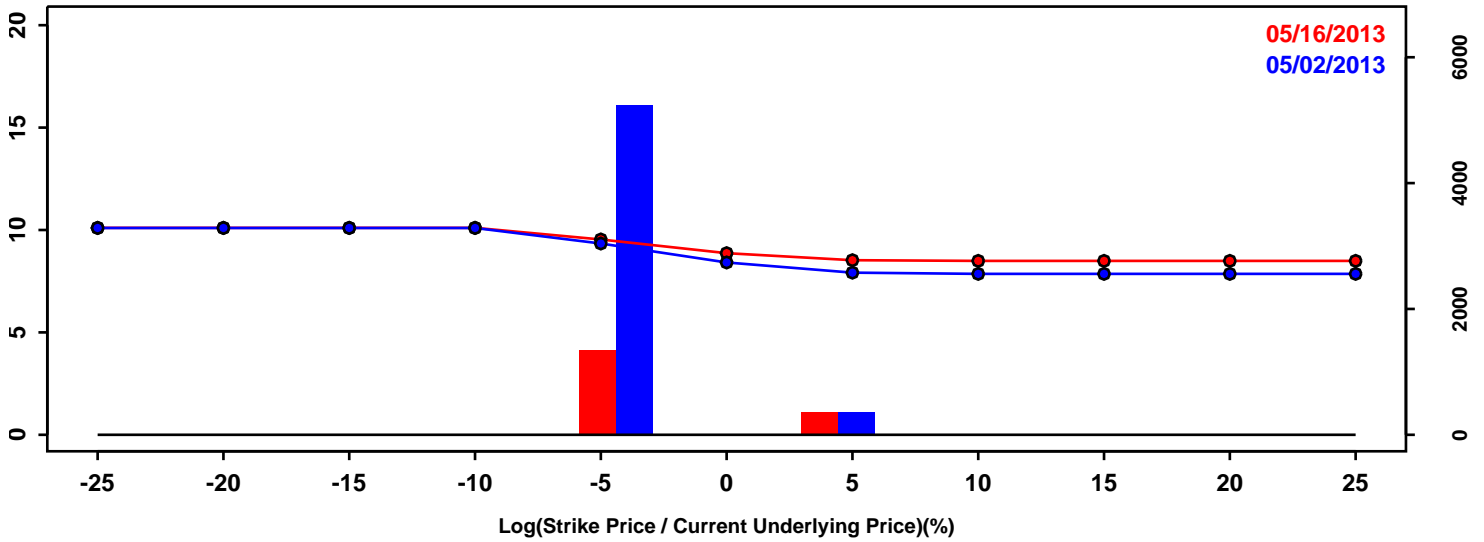


	05/02/2013	05/16/2013	Change
10th Pct	-26.82%	-28.32%	-1.50%
50th Pct	-0.29%	0.09%	0.38%
90th Pct	20.99%	21.92%	0.94%
Mean	-1.69%	-1.67%	0.02%
Std Dev	19.26%	20.40%	1.14%
Skew	-0.38	-0.46	-0.08
Kurtosis	0.61	0.79	0.18

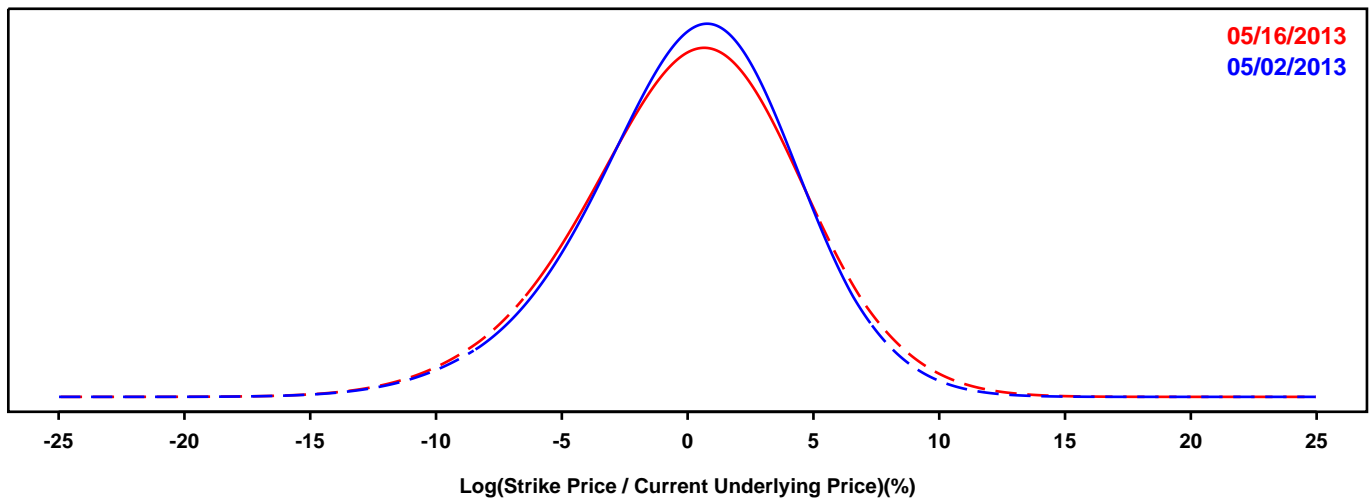
### RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- DOLLAR-EURO EXCHANGE RATE FUTURES

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

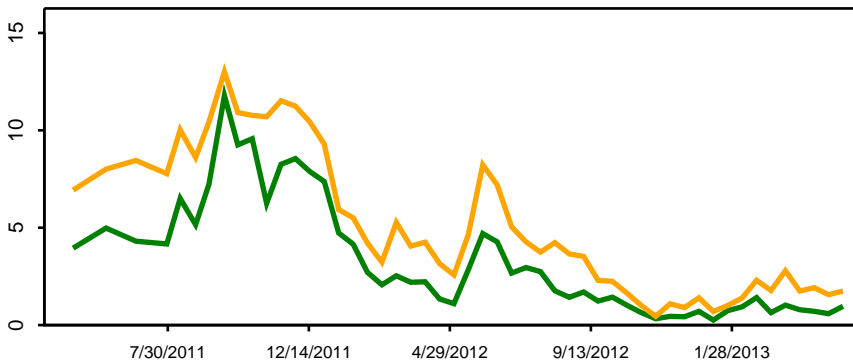
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change



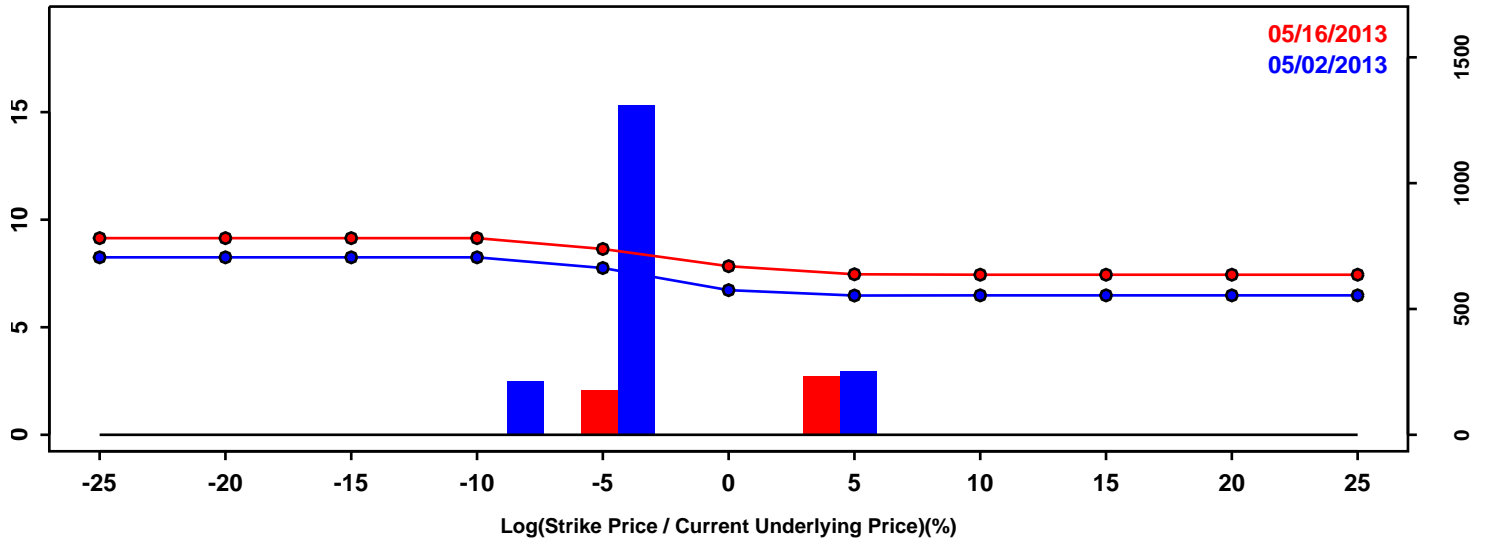
Decrease <= -10% [stronger \$]    Increase >= 10% [weaker \$]

Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-5.32%	-5.63%	-0.31%
50th Pct	0.36%	0.28%	-0.08%
90th Pct	5.22%	5.58%	0.35%
Mean	0.14%	0.17%	0.03%
Std Dev	4.20%	4.42%	0.22%
Skew	-0.32	-0.22	0.09
Kurtosis	0.37	0.24	-0.12

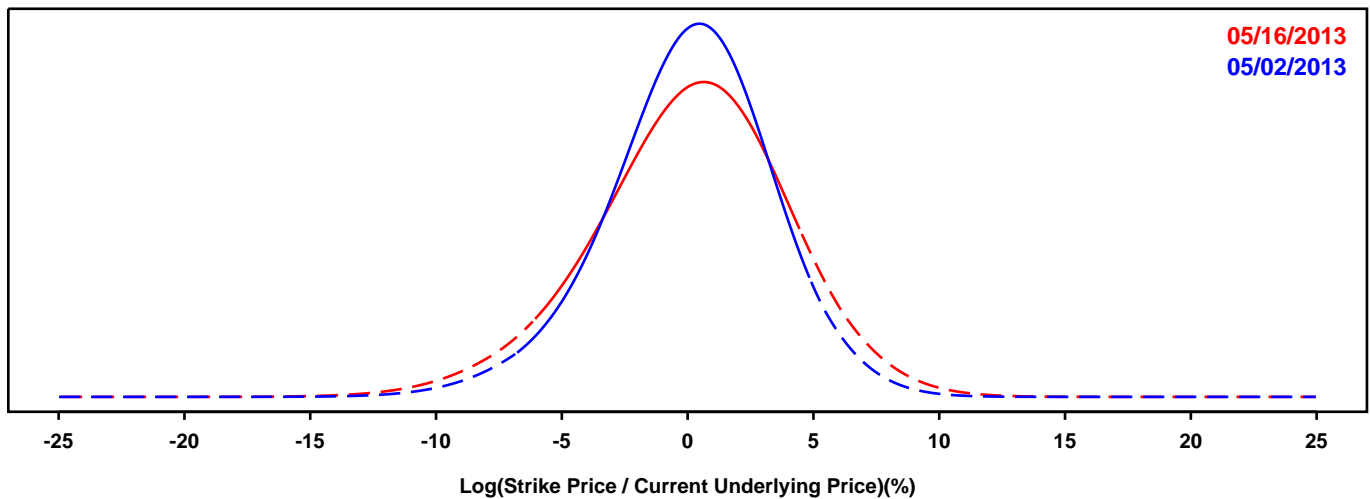
### RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- DOLLAR-POUND EXCHANGE RATE FUTURES

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

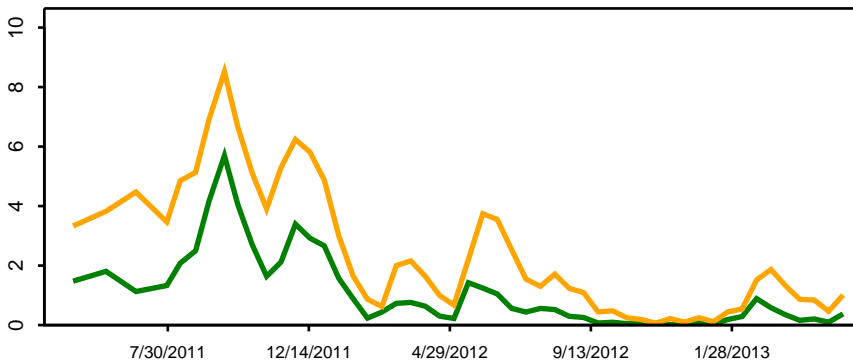
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change



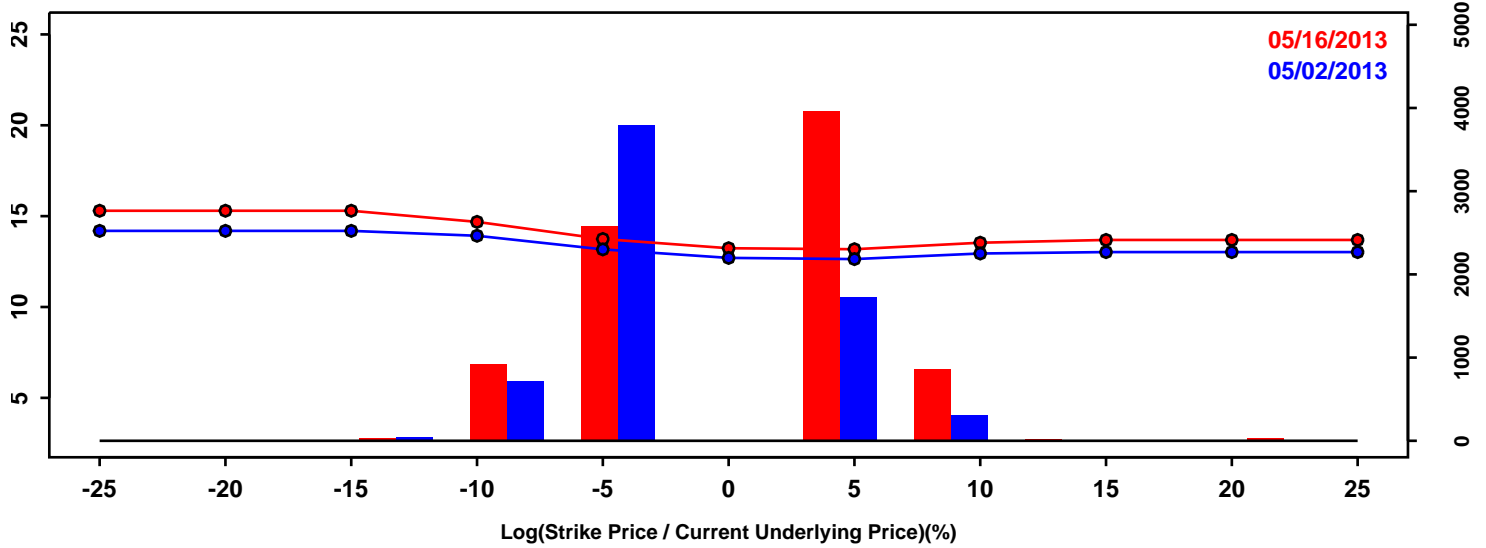
Decrease <= -10% [stronger \$] Increase >= 10% [weaker \$]

Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-4.21%	-4.97%	-0.75%
50th Pct	0.22%	0.28%	0.06%
90th Pct	4.18%	4.94%	0.76%
Mean	0.10%	0.15%	0.06%
Std Dev	3.35%	3.91%	0.56%
Skew	-0.29	-0.26	0.03
Kurtosis	0.46	0.30	-0.16

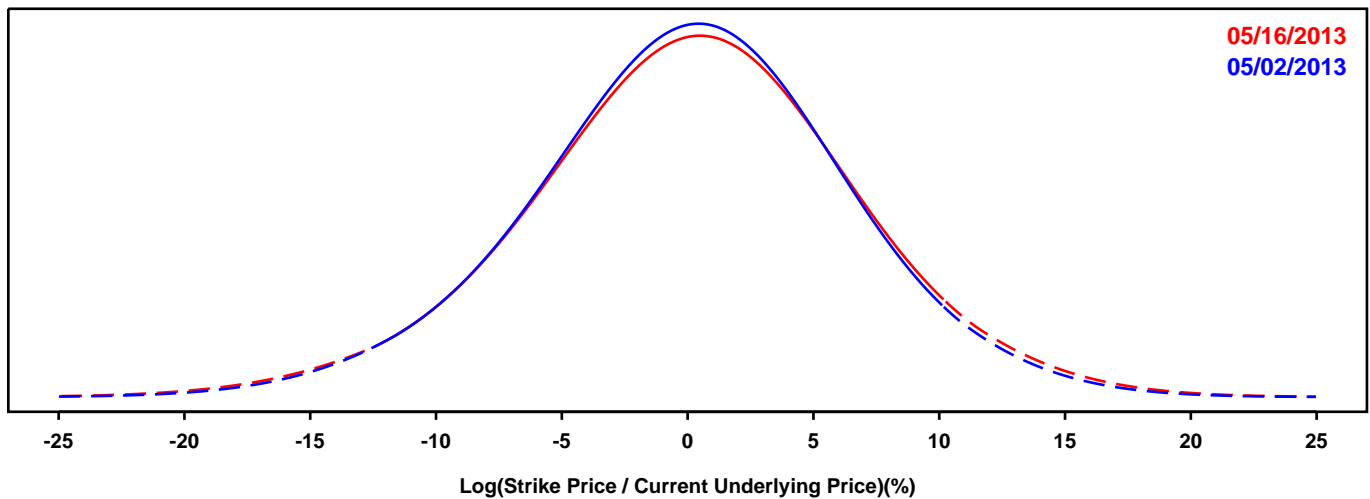
### RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- DOLLAR-YEN EXCHANGE RATE FUTURES

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

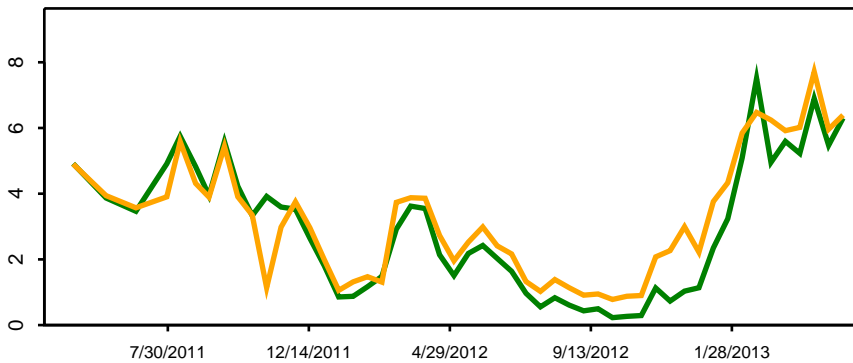
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change



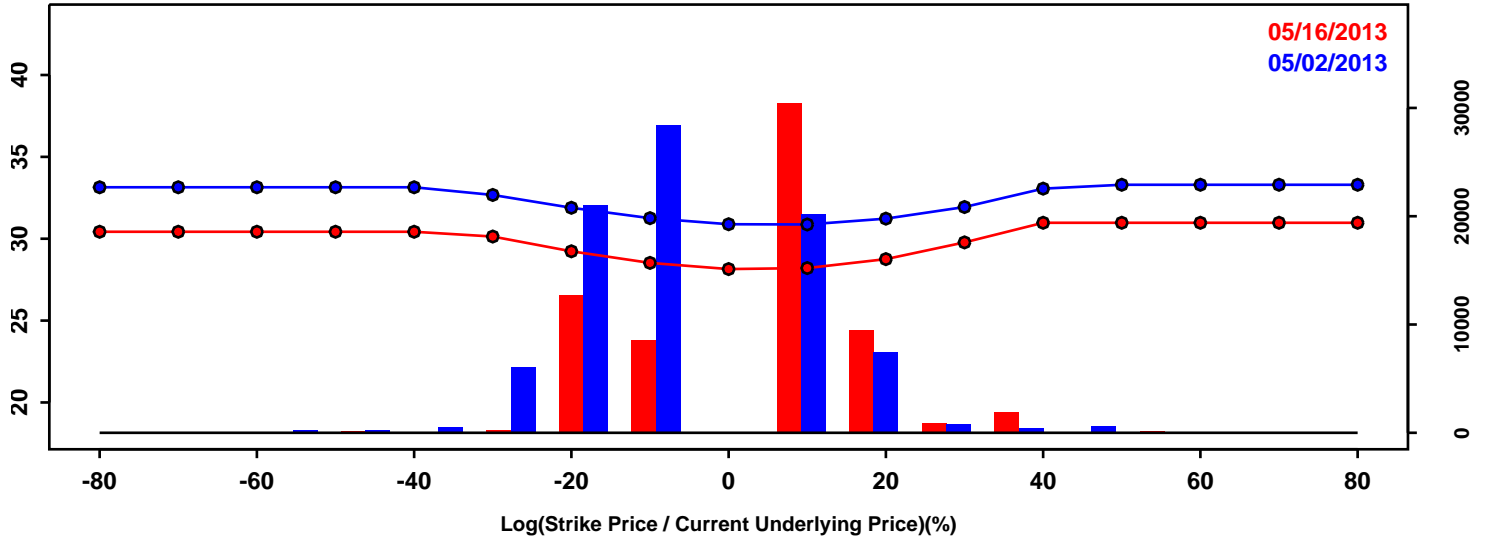
Decrease <= -10% [stronger \$]    Increase >= 10% [weaker \$]

Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-8.01%	-8.12%	-0.10%
50th Pct	0.22%	0.28%	0.06%
90th Pct	7.98%	8.35%	0.37%
Mean	0.11%	0.22%	0.11%
Std Dev	6.33%	6.59%	0.26%
Skew	-0.12	-0.12	-0.01
Kurtosis	0.30	0.38	0.08

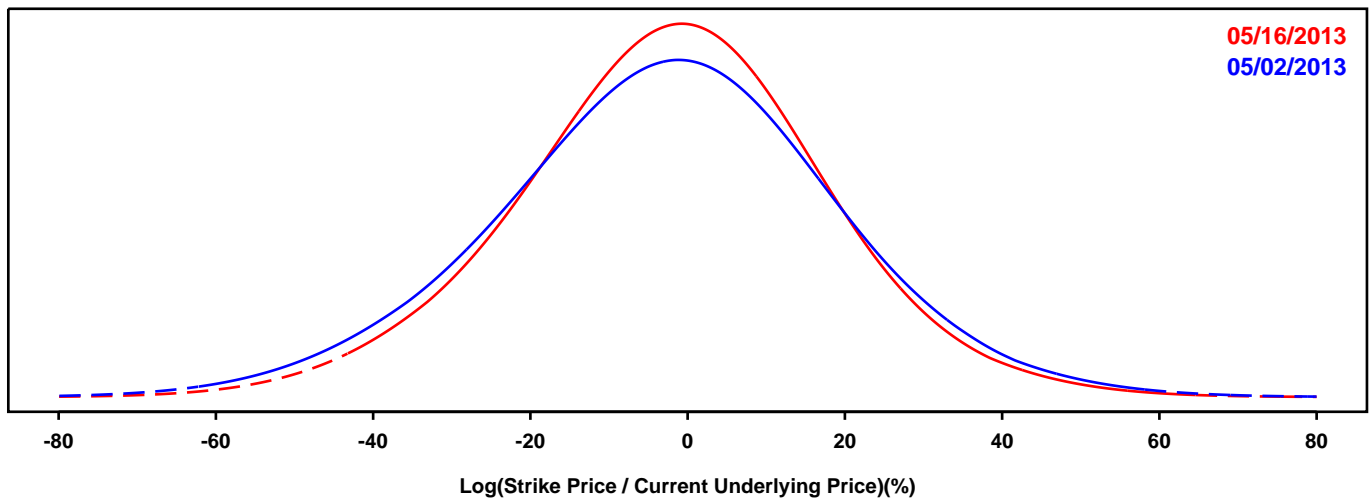
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- CORN FUTURES

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

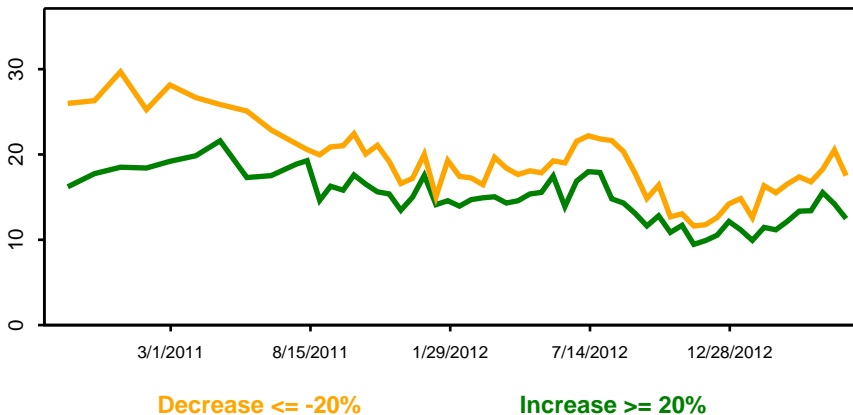
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

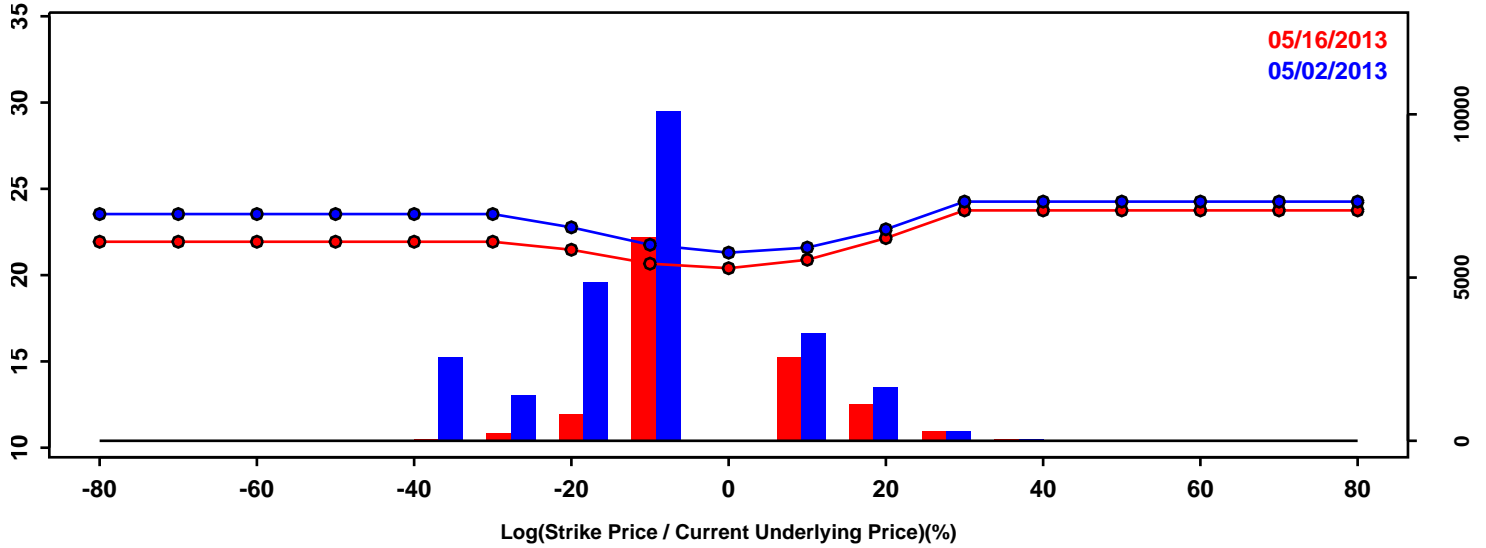


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-30.76%	-27.43%	3.33%
50th Pct	-2.23%	-1.64%	0.59%
90th Pct	24.58%	22.59%	-1.99%
Mean	-2.64%	-2.00%	0.63%
Std Dev	21.88%	19.88%	-2.00%
Skew	-0.08	-0.07	0.01
Kurtosis	0.25	0.32	0.07

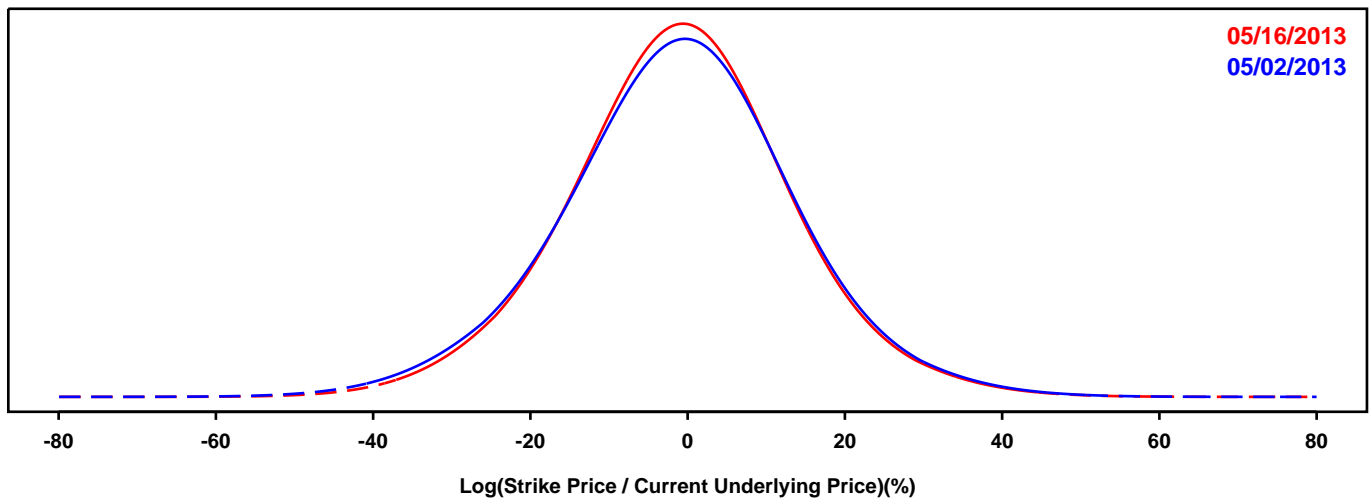
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- SOYBEAN FUTURES

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

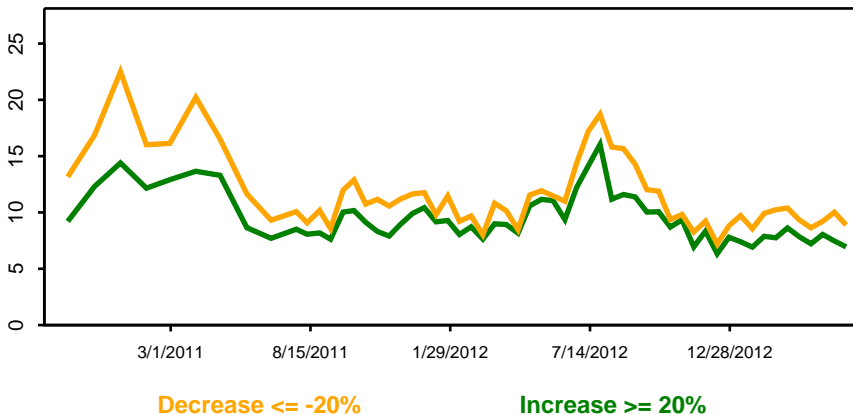
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change



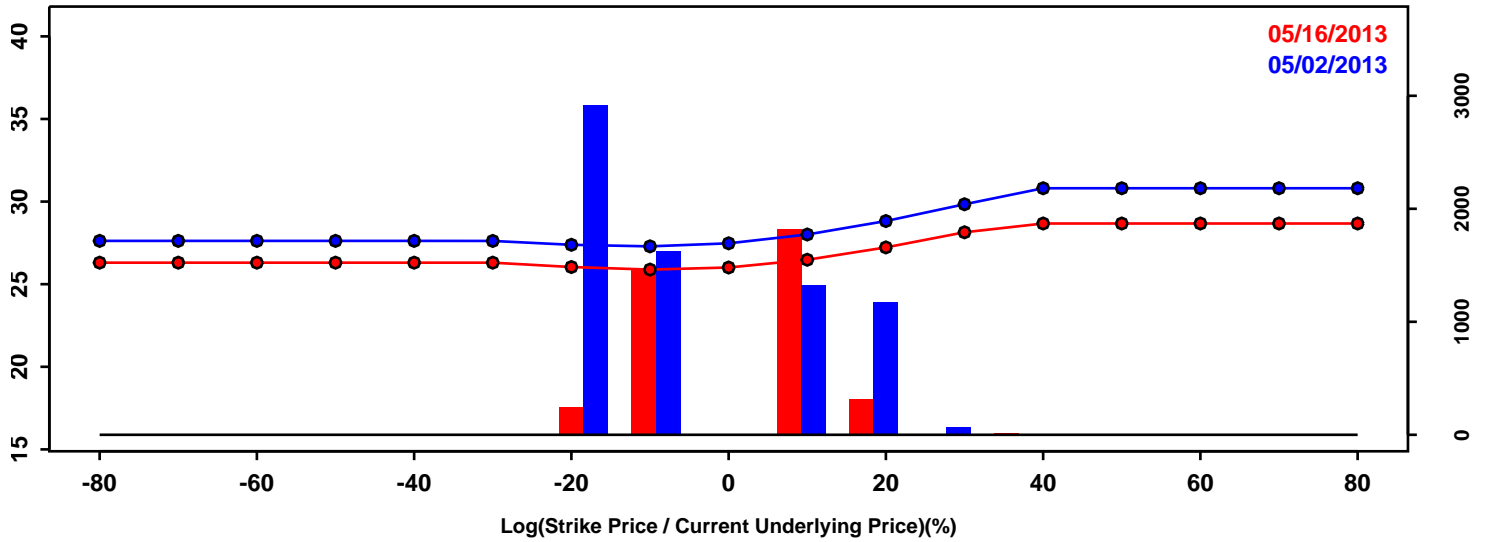
Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-20.00%	-18.97%	1.03%
50th Pct	-0.82%	-0.86%	-0.04%
90th Pct	17.45%	16.87%	-0.58%
Mean	-1.03%	-0.89%	0.14%
Std Dev	15.03%	14.37%	-0.66%
Skew	-0.04	0.03	0.07
Kurtosis	0.46	0.45	-0.01



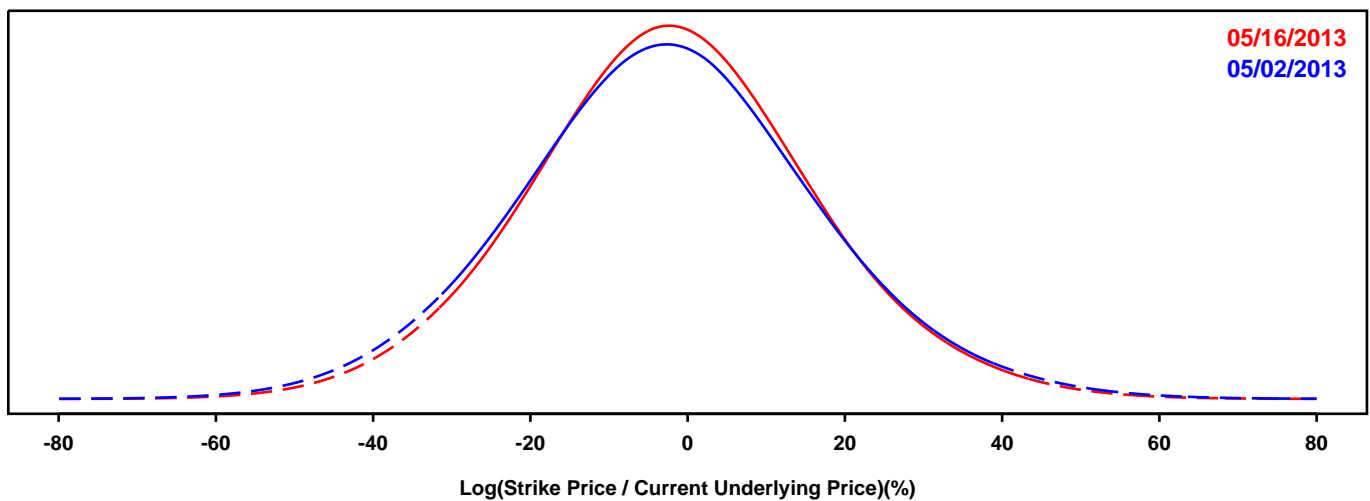
# RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- WHEAT FUTURES

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

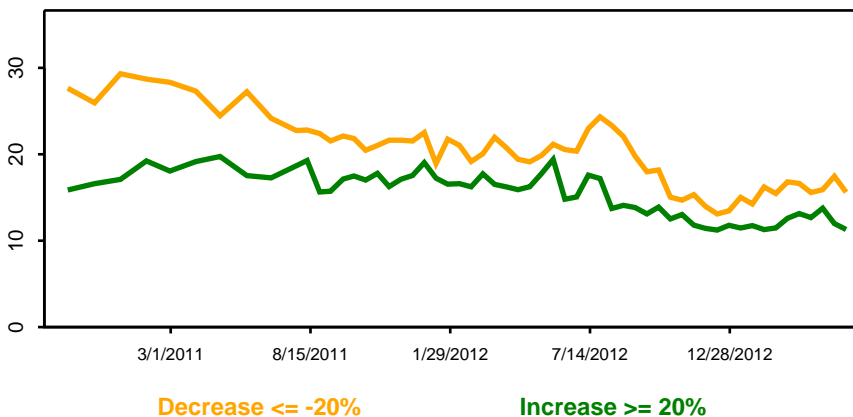
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



Probability of a Large Change

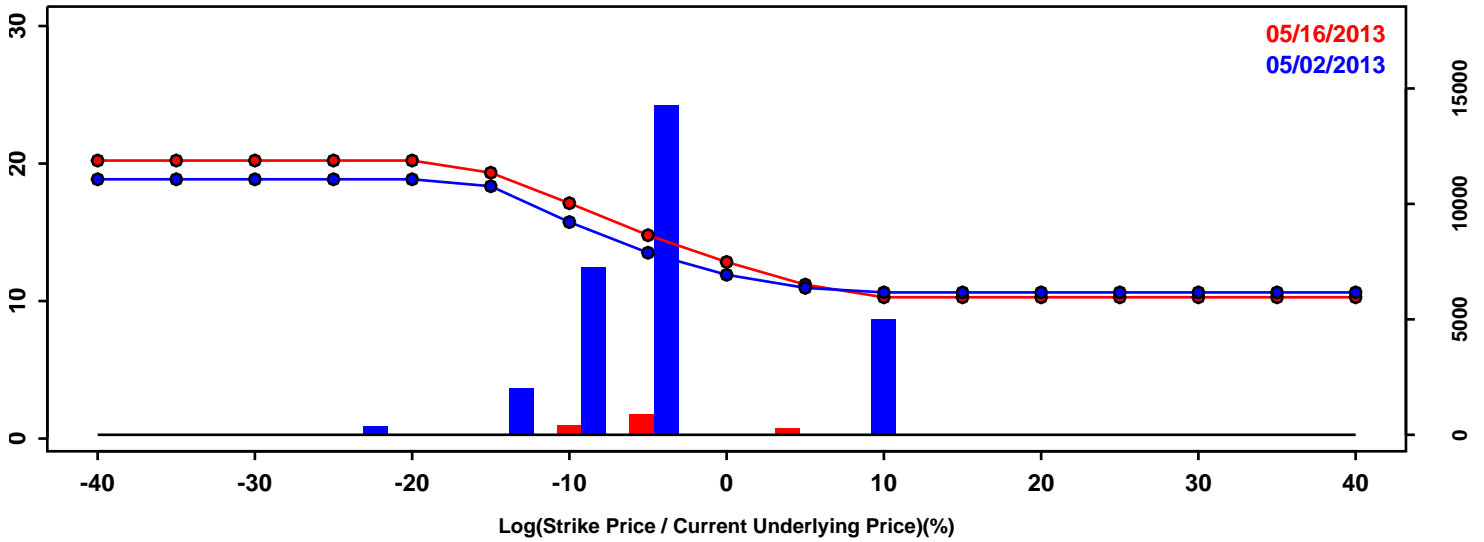


Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-26.68%	-25.02%	1.66%
50th Pct	-2.58%	-2.09%	0.49%
90th Pct	22.19%	21.39%	-0.80%
Mean	-2.32%	-1.86%	0.46%
Std Dev	19.33%	18.33%	-1.00%
Skew	0.09	0.08	-0.01
Kurtosis	0.25	0.23	-0.01

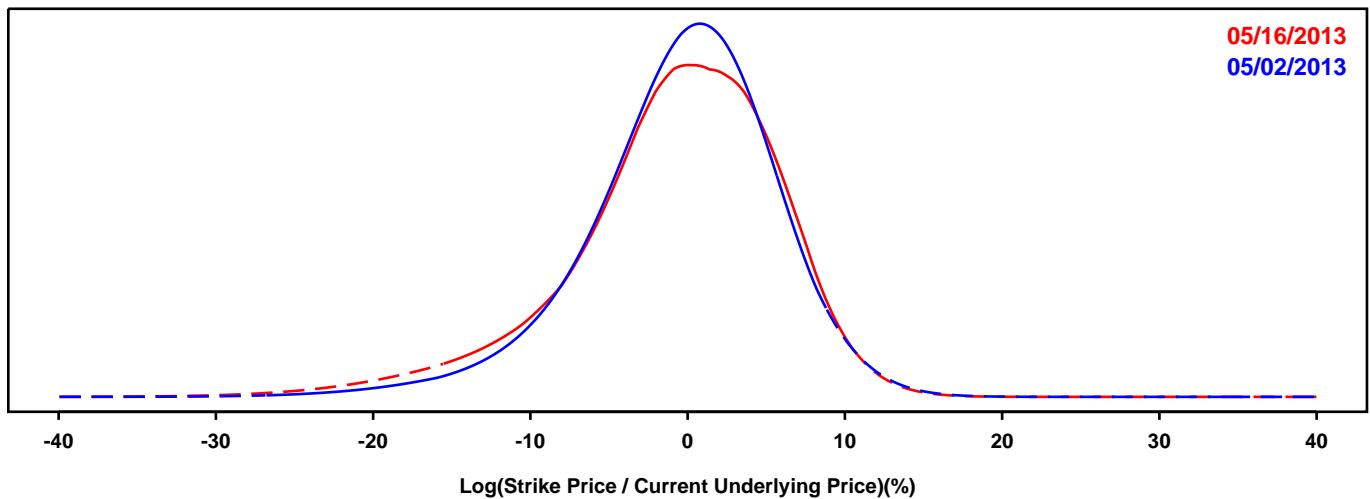
### RISK NEUTRAL PROBABILITY DENSITY FUNCTIONS -- iSHARES DOW JONES US REAL ESTATE

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

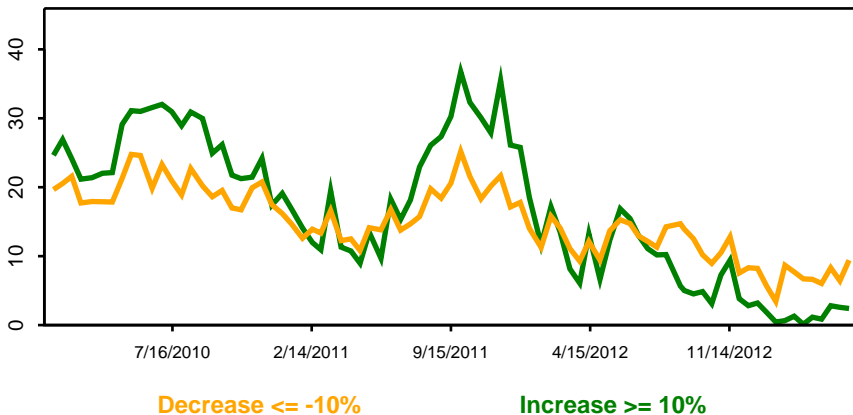
Implied Volatilities (lines--left axis) and Volume (bars--right axis)



Risk Neutral PDF of the Log Return Distribution



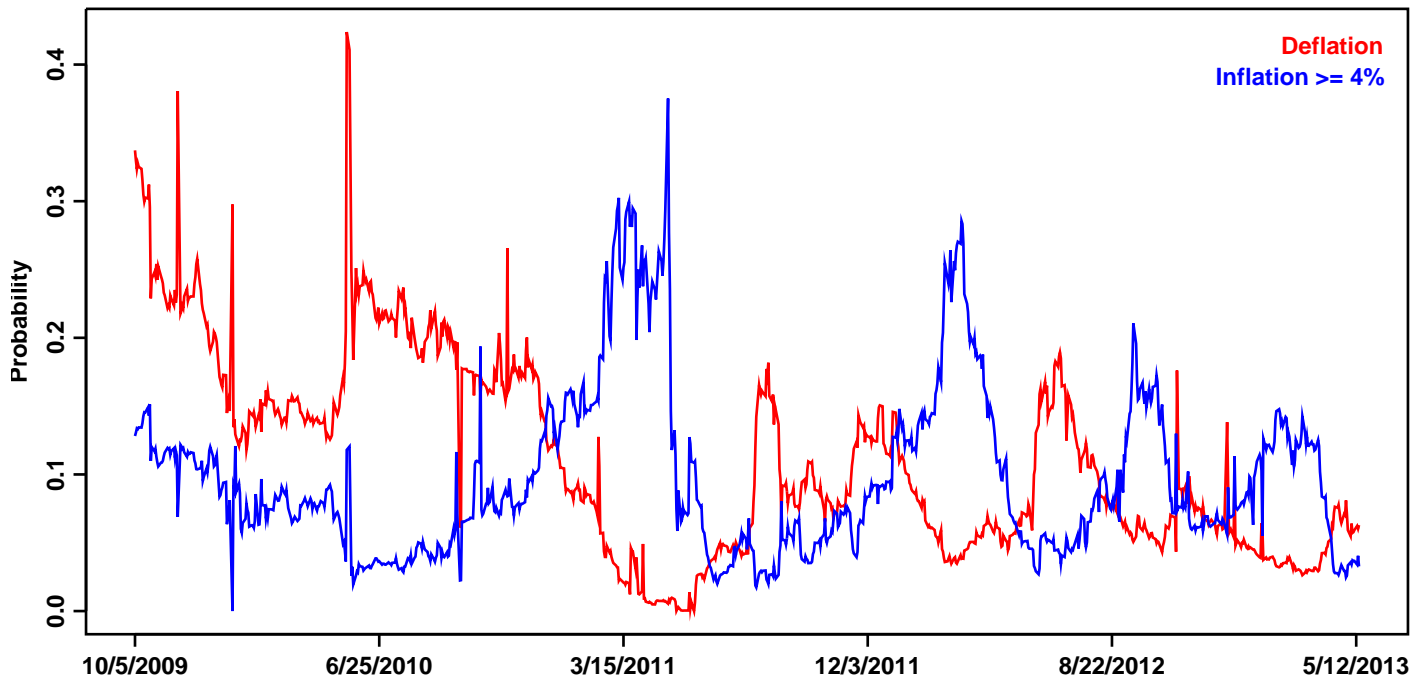
Probability of a Large Change



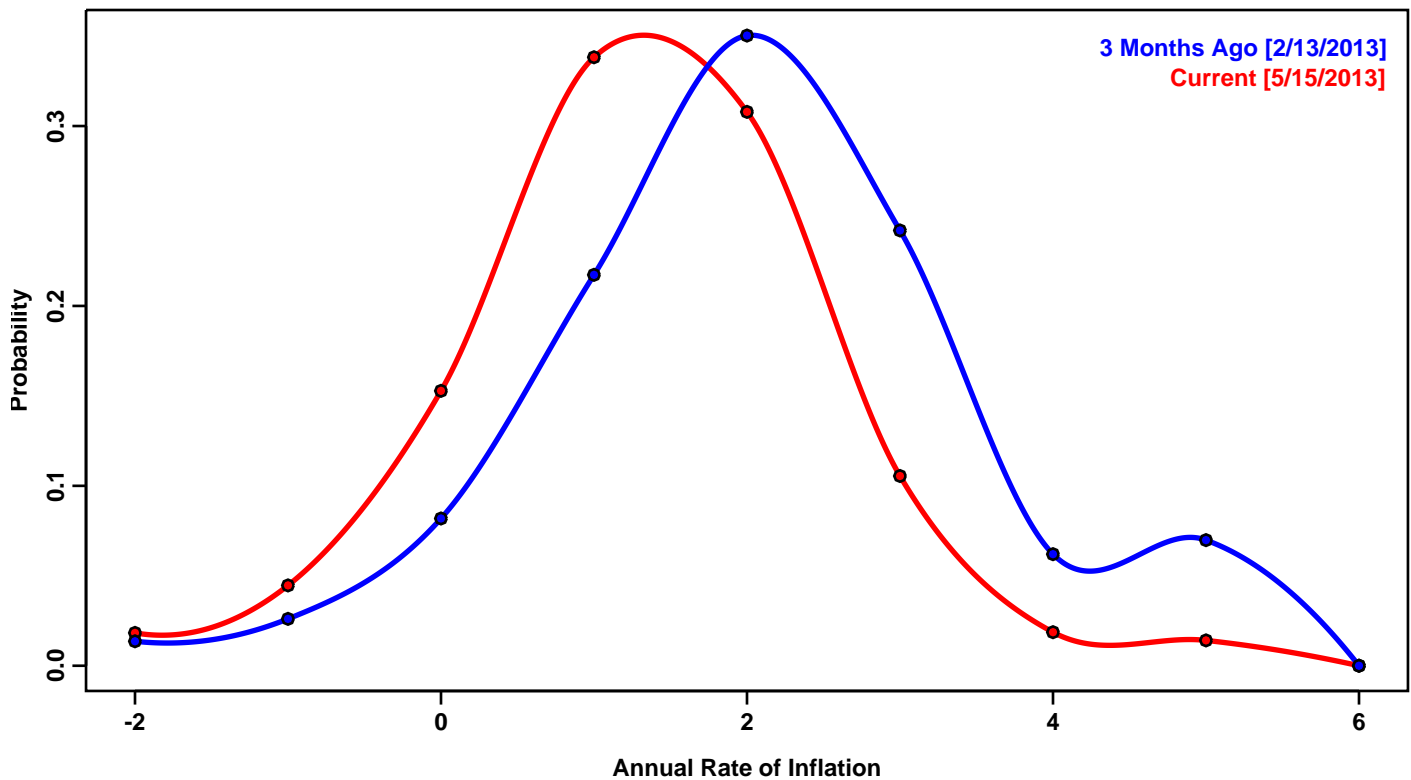
Statistics of the Log Return Distributions			
	05/02/2013	05/16/2013	Change
10th Pct	-8.04%	-9.68%	-1.64%
50th Pct	0.12%	-0.11%	-0.23%
90th Pct	6.62%	6.78%	0.17%
Mean	-0.40%	-0.88%	-0.48%
Std Dev	6.05%	6.80%	0.74%
Skew	-0.67	-0.89	-0.22
Kurtosis	1.34	1.49	0.15

# 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

