



# Extended Profile

## Introduction

Options can be a powerful tool in reaching your financial goals. Using calls and puts can help you minimize your risk and increase your return attaining the payoff picture you desire. Choosing the correct options involves not only strategic but valuation considerations. Option Research & Technology Services ("ORATS") specializes in valuing options by providing:

- 1) volatility forecasts
- 2) volatility skew forecasts.

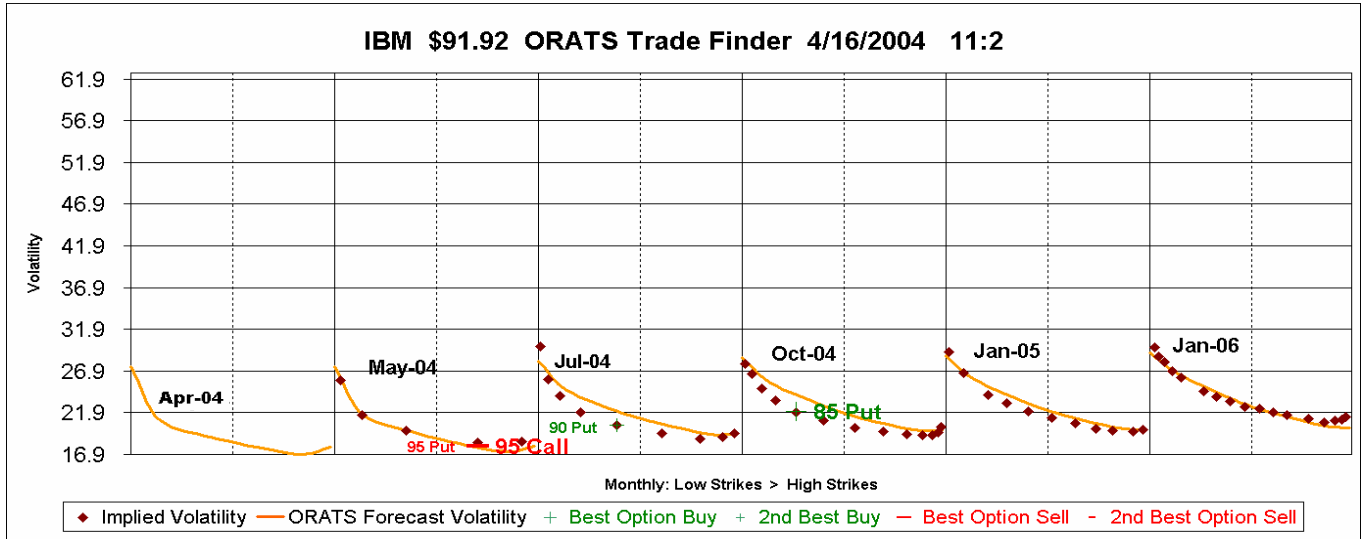
The most important input to option valuation models is volatility. Volatility affects the chance an option will expire in the money or out of the money. Volatility is expressed as an annualized percentage and can be thought of as the amount the underlying stock or index will be away from it's current price in one year. Determining which volatility to use is difficult since the volatility depends on future events. ORATS forecasts future volatility based on 4 years of tick by tick trading information. Implied volatility is what the market thinks the volatility will be for a particular option. When the market price is known the implied volatility can be calculated. The implied volatility is the volatility input where the price from the option valuation model equals the market price. In the market, each option has a different implied volatility. Traders refer to these relationships as the implied volatility skew. Skews often vary and knowing which volatility to use is only the first step: determining where the option fits into the volatility skew is an important consideration. ORATS provides historic skew information along with skew forecasts. (There are actually two skews: a strike-by-strike skew and a month-by-month skew.)

The research displayed in this report is grouped together under 3 Product Names:

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**IBM: Quick Option and Volatility Summary**

The best option to BUY is the Oct 85 Put. The expected probability of profit is 62%.  
 The best option to SELL is the May 95 Call. The expected probability of profit is 51%.  
 Asset volatility is forecast to increase from 12% over the last 20 trading days to 18% for the next 20 trading days.  
 Near term at-the-money implied volatility is forecast to increase from 24% currently to 29% in 20 trading days.



**Legend:**

Brown Diamonds: Delta-weighted call and put market implied volatility of each series at the close of the most recent trading day.  
 Thick Orange Curve: ORATS Forecast volatility.

**Units:**

Vertical Axis: Implied Volatility  
 Horizontal Axis: Expiration Month  
 Horizontal Sub-Axes: Absolute value of the put delta of each series

Profile

<a href="#">ORATS.com</a> <a href="#">PROFILE</a> <a href="#">click here to see what's new at ORATS!</a>										
IBM	93.97	+0.27	from 4/15/04	20 Day Volatility	12%	L.T. Volatility	37%	Slope	3.0%	5.6%
IBM			for 4/16/04	Implied 20day	24%	LongTerm Im	19%	Derivat	0.7%	0.0%
Electronic Computer Manufacturing				FORECAST	18%	LongTerm Im	21%	Implied in 20d	29%	

Underlying Asset Information

<b>IBM</b>	Ticker symbol
<b>93.97</b>	Last price on previous close
<b>+0.27</b>	Net change on previous trading day
IBM	Company name
Electronic Computer Manufacturing	Industry sector
from 4/15/04	Most recent trading day for which research is available
for 4/16/04	Next trading day

Short Term Asset Volatility

20 Day Volatility **12%** Historical asset volatility for the last 20 trading days is calculated from tick data  
**FORECAST 18%** Forecast of underlying volatility for the next 20 trading days based on multiple regressions and weightings

Long Term Asset Volatility

L.T. Volatility **37%** Historical volatility for the last 1076 trading days is calculated from tick data

Short Term At-The-Money Implied Volatility

Implied 20day **24%** Short term at-the-money implied volatility is interpolated at 20 trading days to expiration  
**Implied in 20days 29%** Forecast of Implied 20day in 20 trading days is developed with multiple regressions and weightings

Long Term At-The-Money Implied Volatility

LongTerm Implied **19%** Long term at-the-money implied volatility is interpolated at an infinite number of trading days to expiration  
**LongTerm Implied 21%** Forecast of Implied Infinite is based on a cross-sectional regression

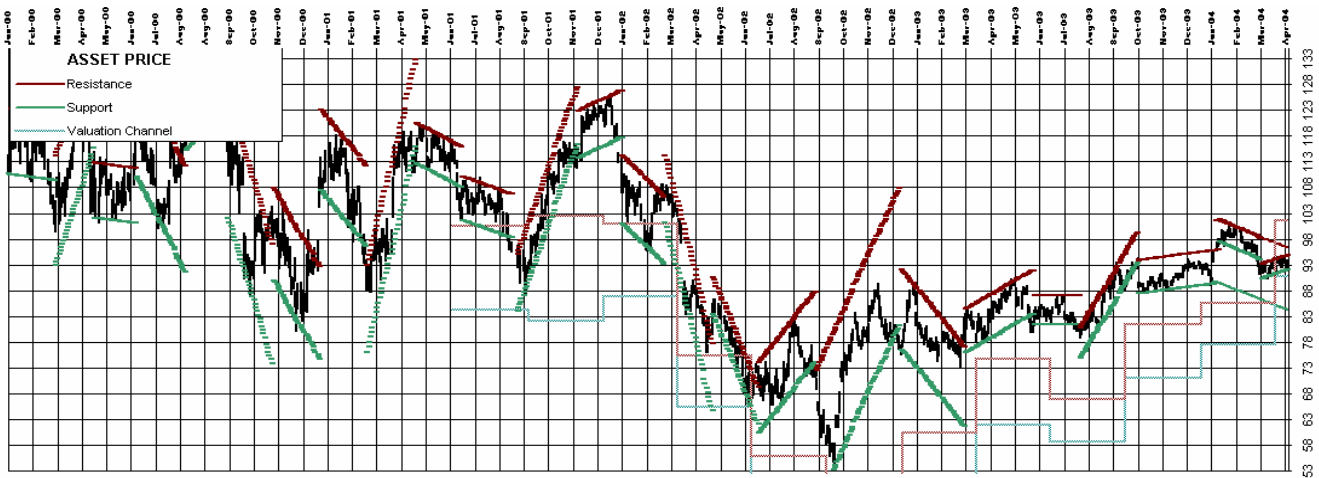
Strike-by-Strike Skew

Implied Slope 5.6% Average percentage change in implied volatility for each 10 delta interval in the volatility smile  
**Forecast Slope 3.0%** Forecast of Slope is based on cross-sectional regression  
 Implied Derivative 0.0% Average change in Implied Slope for each 10 delta interval in the volatility smile  
**Forecast Derivative 0.7%** Forecast of Derivative is based on cross-sectional regression

Compare ORATS median R-squared (goodness of fit) with other methods of forecasting volatility: implied (Implied 20day) and historical (20 Day Volatility)			
Excellent - R-squared greater than 70%; Good - R-squared between 50% & 70%; Fair - R-squared between 30 & 50%; Poor - R-squared below 30%			
FORECAST R-squared	<b>50%</b>	Implied 20day R-squared	<b>23%</b>
		20 Day Volatility R-squared	<b>13%</b>

ORATS uses 4 years of tick data and patent-pending methodology to calculate historical (asset) volatilities. One-day volatilities are calculated by simulating the scalping of a long gamma position and comparing the profit to the cost of the position. This is more accurate than previous methods for calculating volatility.

ORATS has a 4 year database of option quotes upon which we perform our patent-pending implied volatility surface summarization calculations. This enables us to more accurately forecast what the term structure, strike slope and derivative of the implied volatility surface will be in the future.



### ASSET PRICE Graph

X-axis scale is time and the interval between black vertical lines is 30 calendar days. Y-axis scale is price.  
 Daily high-low price bars are displayed in black. Technical support is displayed in green and resistance is displayed in red.  
 Discounted cash flow determines the valuation support and resistance lines (green & red horizontal lines that change quarterly).

#### Underlying Asset Direction Signaling

Red horizontal bars indicate short term SELL signals produced by ORATS algorithms.  
 Green horizontal bars indicate short term BUY signals produced by ORATS algorithms.  
 Approximate absolute trade return (not annualized) is shown with a yellow triangle on the ASSET VOLATILITY Graph below.  
 Note: Signals are only produced by the ORATS algorithms when very stringent criteria are met; therefore, they do not appear for all equities.

Technical Channel				
93.97	Support	Resist	Days in	Slope
30	92.2	95.0	21	0.1
40	84.1	96.2	62	-0.1

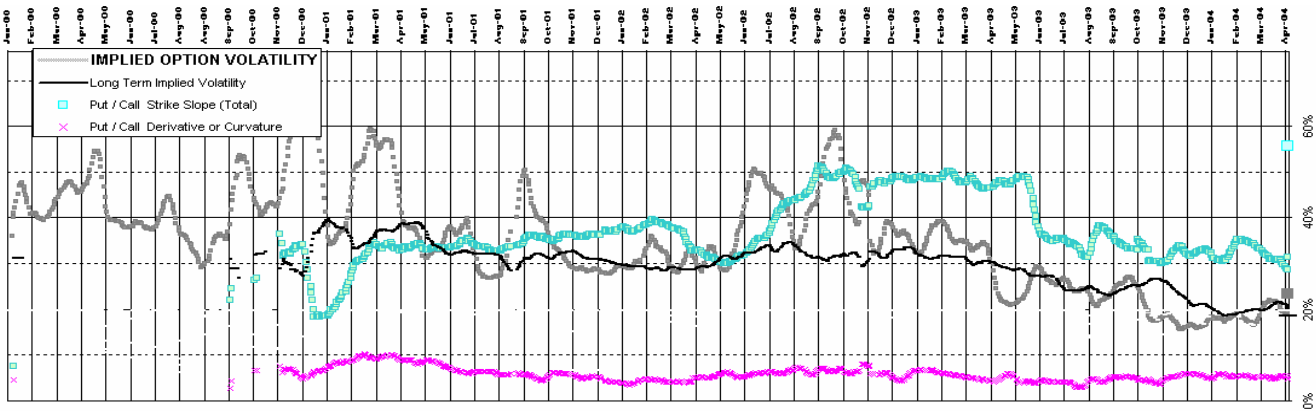
#### Technical Channel

Technical channels are calculated for 10, 20, 30, 40 & 80 trading day minimum development lengths.  
 Support & resistance lines of the best-fitting channel are displayed for the entire graph. Best-fitting channel is the 30 day.  
 Support & resistance lines of the most persistent trend at this time are overlaid on the rightmost side of the graph.  
 IBM is not breaking up or down out of the best-fitting and the most persistent trend.  
 Most persistent trend is currently the 40 day (greatest ratio of "Days in" to "minimum development length")

#### Underlying Asset Price Range

Trading range for last 1076 trading days  
 Median price for last 1076 trading days  
 Trading range for last 100 trading days  
 Trading range for last 20 trading days  
 Trading range for last 5 trading days  
 Trading range for most recent trading day  
 Recency-weighted trading range

PriceRange	
low	high
54.0	134.9
95.3	
88.2	100.4
90.3	94.6
92.1	94.4
93.1	94.1
91.8	94.3



### IMPLIED OPTION VOLATILITY Graph

X-axis scale is time and the interval between black vertical lines is 30 calendar days. Y-axis scale is Implied Volatility

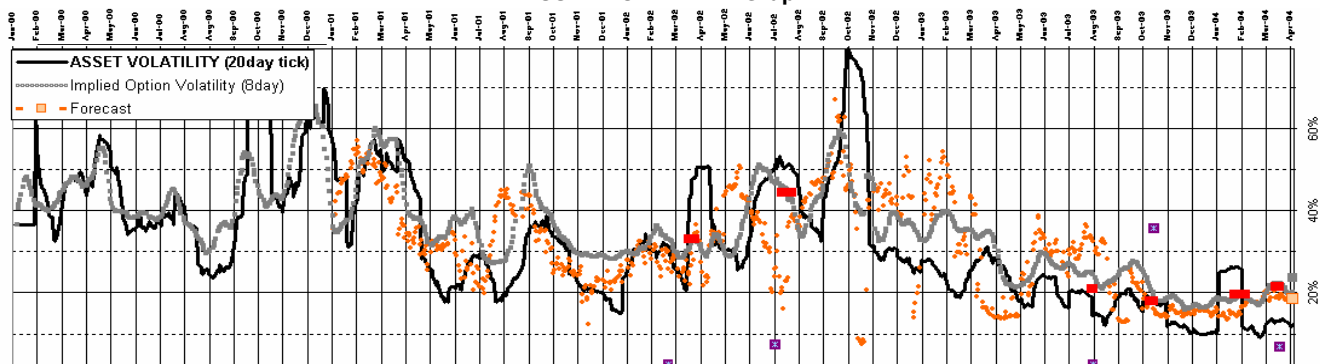
8-day average of Implied 20 day is depicted in gray  
 8-day average of Long Term Implied is depicted in black  
 8-day average of Implied Slope is depicted in turquoise. (displayed as 10 times the actual value)  
 8-day average of Implied Derivative is depicted in pink. (displayed as 10 times the actual value)

Implied Channel					
23.7%	Implied OptionVol	Support	Resist	Days in	Slope
		17.9%	20.3%	20	-0.2

#### Implied Channel

Implied 20 day has been in a downtrend for the last 20 trading days. The trend slope is -0.2 volatility points per trading day.  
 Implied 20 day trend support is 17.9% and resistance is 20.3%.

### ASSET VOLATILITY Graph



X-axis scale is time and the interval between black vertical lines is 30 calendar days. Y-axis scale is Implied Volatility 8-day average of Implied 20 day is depicted in gray. 20 Day Volatility is depicted by with a thick black line. FORECAST of the next 20 trading days of asset volatility is depicted in orange dots. The current FORECAST is shown on the right hand side of the graph as a large orange square

### Volatility Signaling

Red horizontal bars close to the Implied 20 day indicate short term volatility SELL signals produced by ORATS algorithms.  
 Green horizontal bars close to the Implied 20 day indicate short term volatility BUY signals produced by ORATS algorithms.  
 Approximate absolute trade return (not annualized), based on the premium over parity that the trade involved, is shown with purple squares.  
 Note: Signals are only produced by the ORATS algorithms when very stringent criteria are met; therefore, they do not appear for all equities.  
 Note: Yellow triangles indicate the approximate absolute return for Underlying Asset Direction Signal (see Underlying Asset Direction Signaling section above)

### Historical Volatilities

	FORECAST	Asset Volatility	Implied 20 day	Average Daily Difference
Average for last 1076 trading days	24%	37%	38%	-3%
Median for last 1076 trading days	22%	24%	36%	-5%
Average for last 100 trading days	15%	15%	21%	-4%
Average for last 20 trading days	15%	12%	23%	-8%
Average for last 5 trading days	15%	15%	23%	-8%
Most recent trading day	16%	6%	24%	-18%

On average, historical one-day asset volatility has been 1 volatility point(s) less than the Implied 20 day.  
 On the median day, historical one-day asset volatility was 3 volatility point(s) less than the Implied 20 day.

### Current Options

Currently Trading Expiration Months

Market At-The-Money (ATM) Implied Volatility

Market Implied Volatility Strike Slope (see Volatility Smile section)

Forecast At-The-Money Volatility

The Forecast ATM Volatility applies FORECAST (see Short Term Asset Volatility section above); LongTerm Implied (see Long Term Implied Volatility section above); FEEF (see Earnings Announcement Effects section below); and ORATS term structure equations.

	Apr-04	May-04	Jul-04	Oct-04	Jan-05	Jan-06
55%	24%	21%	21%	22%	22%	
Slope 10.4%	5.5%	5.7%	6.1%	6.6%	5%	
18%	19%	22%	22%	23%	23%	

### Earnings Announcement Effects

Expiration Month

Forecast Earnings Effect (included in monthly ATM forecasts above)

Next Earnings Announcement Date

FEEF: Forecast Earnings Effect Factor (used to calculate Earnings Effects)

7/15

3.35

	Apr-04	May-04	Jul-04	Oct-04	Jan-05	Jan-06
Effect%			2.1%	2.2%	2.2%	2.3%

To calculate the Forecast Earnings Effect Factor (FEEF) the following steps are taken:

1. Earnings Volatility: Historical volatility is averaged on the day of and the day following an earnings announcement
2. Forecast Volatility: ORATS FORECASTS are averaged for the quarter that precedes the earnings announcement
3. Quarterly Earnings Effects: For each earnings quarter studied, the Earnings Volatility is divided by the Forecast Volatility
4. Quarterly Earnings Effects are averaged (recent observations given more weight) to yield the Forecast Earnings Effect Factor

Earnings Announcement Dates

Average Implied 20 day between announcements

Average asset volatility between announcements

Average FORECAST between announcements

Quarterly Earnings Effects

	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Jul-03	Oct-03	Jan-04	Apr-04	Apr-04
29%	32%	42%	48%	37%	31%	26%	23%	18%	21%	24%	
23%	38%	38%	53%	39%	26%	20%	18%	19%	18%	6%	
31%	20%	18%	26%	27%	31%	20%	18%	16%	14%	16%	
1.98	2.51	2.75	5.77	1.64	0.99	1.99	2.54	4.51		3.35	

## Tick Data Analysis

### Simulated Scalping Profits

Hedging Interval	\$0.50	\$1.00	\$2.00	25%	37.5%	50%	75%	100%	200%	300%	Max one day profit
Average for last 1076 trading days	1,866	2,040	2,189	1,935	2,045	2,102	2,213	2,347	2,385	2,365	142472
Median for last 1076 trading days	1,147	1,235	1,121	1,142	1,160	1,255	1,128	1,013	848	847	
Average for last 100 trading days	507	498	516	475	496	503	526	489	491	491	13826
Average for last 20 trading days	464	344	264	419	465	460	376	303	264	264	947
Average for last 5 trading days	460	487	543	443	460	529	471	695	543	543	947
Most recent trading day	262	12	12	473	262	502	12	12	12	12	212
Recency-weighted trading scalping profit	395	281	273	445	396	497	286	337	273	273	

Scalping profits are estimated by simulating 10 different delta hedging strategies based on the following assumptions:

Hypothetical long option position has 1000 gamma across a large range of strike prices

Prior to the opening of trading, the position delta, option deltas plus underlying asset deltas, is zero

As soon as possible after the opening, the underlying asset is bought or sold to neutralize the position delta

During regular market hours, the position is hedged at regular price change intervals

Immediately prior to the close of regular market hours, the underlying asset is bought or sold to neutralize the position delta

Scalping profits are the sum of the profits achieved by trading the underlying asset

Fixed Hedge Intervals: The first three columns represent scalping profits based on hedging intervals of \$0.50, \$1.00 & \$2.00

Dynamic Hedge Intervals: The next seven columns contain average scalping profits based on hedging intervals that are percentages of the Expected Daily

Standard Deviation. Example: 25% times \$1.25 (expected daily standard deviation) = \$0.3125 Hedging Interval

### Delta Hedging Strategy

Recently, the best hedging interval for a long gamma position has been 50% of the expected daily standard deviation or approximately \$0.62.

Recently, the best hedging interval for a short gamma position has been \$2.00.

The best hedging interval for a long gamma position, based on highest long term average daily profit, has been 200% of the expected daily standard deviation.

The best hedging interval for a short gamma position, based on lowest long term average daily profit, has been 25% of the expected daily standard deviation.

The best hedging interval for a long gamma position, based on highest long term median daily profit, has been 50% of the expected daily standard deviation.

The best hedging interval for a short gamma position, based on lowest long term median daily profit, has been 300% of the expected daily standard deviation.

sd 1.25

Expected daily standard deviation of the price is currently \$1.25.

1000gamma\$ 1,094

Straight-line decay of a 1000 gamma position is currently \$1094 per trading day.

### Top 5 Positively-Correlated Equities based on Asset Volatility

Top correlated volatilities	IBM:	QLGC 60%	ONE 58%	DIA 55%	QQQ 53%	CMA 52%
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Ticker Symbol	Correlation Coefficient
IAH	60%
QLGC	58%
DIA	55%
MWD	53%
SAP	52%

Correlation coefficients indicate whether the one-day asset volatility of one equity moves together with the one-day asset volatility of another equity.

Correlations are calculated using the last 252 one-day volatilities

Correlation coefficients greater than 70% indicate a strong positive relationship

Correlation coefficients between 50% and 70% indicate a weak positive relationship

Correlation coefficients between -50% and 50% do not indicate a relationship

### TradeFinder

TRADE FINDER Top 10 BUYS and Top 10 SELLS greater than 1 month and less than 1 year out (based on probability of										IBM	91.92	4/16/04	11:02						
BUYS 0.04 BASIS adjustment 0-100%(best)					Market ASK to ORATS Market					SELLS 0 L.T. Dividend Adj					Market BID to ORATS Market				
Rank	Month	Strike	Type	Score(%)	Ovol	Obid	Othv	Oask	Rank	Month	Strike	Type	Score(%)	Ovol	Obid	Othv	Oask		
1	Oct-04	85	Put	62%	24%	1.57->	<-3.17	4.89	1	May-04	95	Call	51%	18%	0.33	0.89->	<-1.53		
2	Jul-04	90	Put	61%	22%	2.07->	<-3.16	4.29	2	May-04	95	Put	50%	18%	3.45->	<-4	4.67		
3	Jul-04	85	Put	61%	24%	0.73->	<-1.65	2.71	3	Jan-05	110	Call	48%	20%	0.28->	<-1.48	3.27		
4	Oct-04	80	Put	60%	25%	0.67->	<-1.93	3.48	4	May-04	90	Put	48%	20%	0.75->	<-1.44	2.19		
5	Oct-04	90	Call	60%	23%	5.2->	<-6.93	8.67	5	Jan-05	105	Call	47%	21%	0.78->	<-2.43	4.44		
6	Oct-04	90	Put	60%	23%	3.18->	<-4.92	6.69	6	Oct-04	105	Call	46%	20%	0.32->	<-1.32	2.7		
7	Oct-04	85	Call	59%	24%	8.59->	<-10.17	11.87	7	Jan-05	80	Call	46%	25%	13.2->	<-15.02	17.13		
8	Jul-04	85	Call	59%	24%	7.71->	<-8.61	9.65	8	Jan-05	100	Call	45%	21%	1.83->	<-3.86	6.04		
9	Oct-04	95	Call	58%	22%	2.66->	<-4.34	6.03	9	Jan-05	100	Put	45%	21%	9.76->	<-11.77	13.97		
10	Jul-04	90	Call	58%	22%	4.02->	<-5.12	6.22	10	Jan-05	85	Call	45%	24%	9.35->	<-11.51	13.77		

Options shown have greater than 1 month and less than 1 year to expiration

0.04 BASIS adjustment

Theoretical values are being calculated based on the underlying price plus the BASIS adjustment

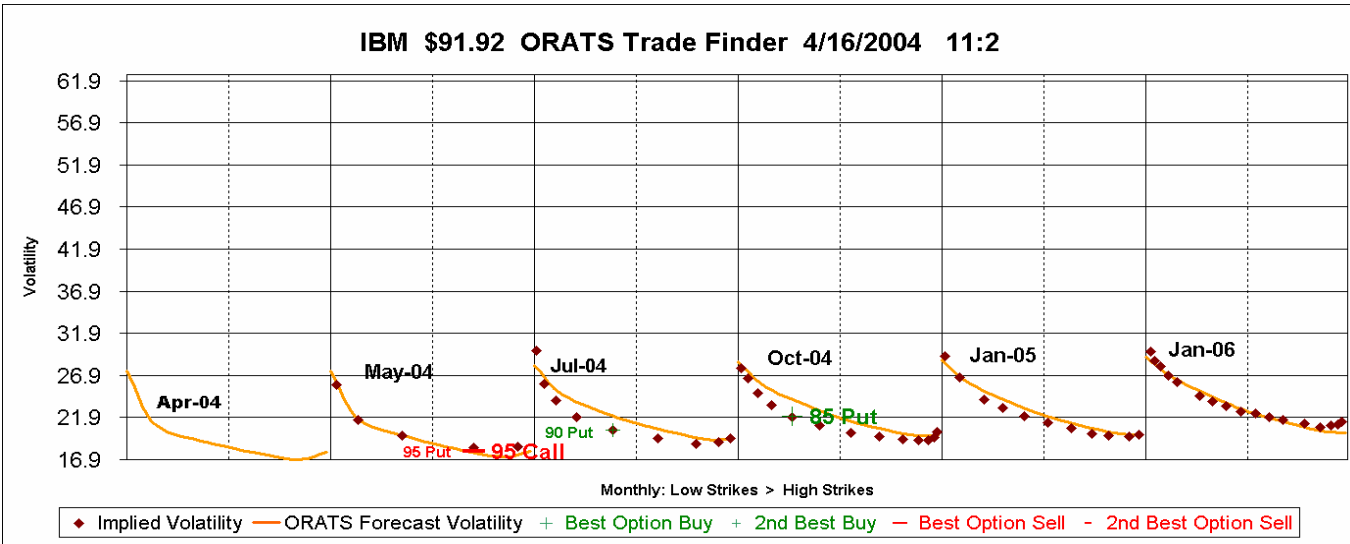
Market ASK to ORATS Market
0 L.T. Dividend Adj
Market BID to ORATS Market

Arrows indicate where the Market Ask price is relative to the ORATS bid, ask and theoretical value  
 Theoretical values are calculated with the dividends in the datafeed plus the Dividend adjustment  
 Arrows indicate where the Market Bid price is relative to the ORATS bid, ask and theoretical value

Rank
Month
Strike
Type
Score(%)
Ovol
Obid
Othv
Oask

Ranges from 1-10. Lower numbers indicate higher probability of profit.  
 Expiration month.  
 Exercise price  
 Call or Put  
 Probability of profit. Ranges between 0% and 100%. Higher is better.  
 ORATS Forecast volatility for the option.  
 Theoretical bid price. Theoretical value minus one standard forecast error.  
 Buying the option at the theoretical bid price yields an expected probability of profit of 84%.  
 Theoretical value based on forecast volatility  
 Theoretical ask price. Theoretical value plus one standard forecast error.  
 Selling the option at the theoretical ask price yields an expected probability of profit of 84%.

**ORATS Forecast and Market Implied Volatilities Graph**



**Legend:**

Brown Diamonds: Delta-weighted call and put market implied volatility of each series at the close of the most recent trading day.  
 Thick Orange Curve: ORATS Forecast volatility.

**Units:**

Vertical Axis: Implied Volatility  
 Horizontal Axis: Expiration Month  
 Horizontal Sub-Axes: Absolute value of the put delta of each series

## PressureGauge

### Implied Volatility Skew Summary and Change from Previous Day (with the Top 5 Correlated Stocks)

Time	Volatility	Stock Px	Monthly Option Volatility							Market Fit		Slope %		Derivative %		Forecast 20day		
			Stock	Apr-04	May-04	Jul-04	Oct-04	Jan-05	Jan-06	20bday	Infinite	S.T.	L.T.	S.T.	L.T.	vs. Implied 20day	+/- Valuation	
Correlat	change		Mo#1	Mo#2	Mo#3	Mo#4	Mo#5	Mo#6	Mo#7									
4/16/04	<b>91.92</b>			31.2	19.0	19.9	20.4	21.4	22.4	-	<b>18.0</b>	<b>21.1</b>	2.6	3.1	0.6	0.6	<b>18.0</b>	<b>12.2</b>
4/15/04	92.10	<b>IBM</b>		54.5	24.0	21.1	21.1	21.7	22.2	-	23.5	18.9	5.5	5.7	-	-	-2.4%	47.9%
	-0.2%			-74.6%	-26.2%	-6.0%	-3.4%	-1.5%	1.2%		-30.7%	10.4%		-80.5%	100.0%	100.0%		
2004041	<b>29.28</b>			76.6	45.0	42.5	42.1	42.3	41.2	-	<b>40.3</b>	<b>39.5</b>	1.1	2.5	0.6	0.4	<b>40.1</b>	<b>38.0</b>
2004041	29.85	<b>QLGC</b>		36.7	44.1	42.7	42.1	41.8	41.1	-	39.4	39.7	1.3	4.4	0.2	-		
<b>60% cor</b>	-1.9%			52.1%	2.1%	-0.5%	0.0%	1.1%	0.3%		2.3%	-0.3%	-21.7%	-73.9%	64.9%	100.0%	0.5%	0.6%
2004041	<b>51.72</b>			48.4	21.9	22.9	23.4	24.0	24.6	-	<b>20.2</b>	<b>24.8</b>	4.3	4.9	0.7	0.6	<b>30.9</b>	<b>23.0</b>
2004041	50.59	<b>ONE</b>		25.7	23.2	23.7	24.0	24.5	24.8	-	22.0	24.8	4.5	5.2	0.5	0.2		
<b>58% cor</b>	2.2%			46.9%	-5.9%	-3.7%	-2.6%	-2.3%	-1.1%		-9.1%	0.0%	-5.5%	-6.2%	32.9%	69.8%	-53.3%	-14.0%
2004041	<b>104.36</b>			13.3	13.3	14.4	15.4	15.8	15.9	15.9	<b>12.4</b>	<b>17.3</b>	5.8	6.6	0.9	0.7	<b>7.7</b>	<b>12.0</b>
2004041	104.07	<b>DIA</b>		13.5	13.8	14.7	15.4	16.1	16.1	16.1	13.3	17.3	5.9	6.5	1.1	0.9		
<b>55% cor</b>	0.3%			-1.6%	-4.0%	-1.8%	-0.3%	-1.9%	-1.1%	-1.1%	-7.1%	0.2%	-1.8%	1.3%	-25.3%	-16.4%	38.0%	3.5%
2004041	<b>36.21</b>			54.9	21.4	22.6	24.0	24.6	24.7	25.2	<b>20.6</b>	<b>26.7</b>	4.5	5.3	0.5	0.3	<b>15.6</b>	<b>20.0</b>
2004041	36.16	<b>QQQ</b>		33.4	21.9	23.4	24.4	24.8	24.7	25.3	21.5	26.3	4.6	4.7	0.1	0.5		
<b>53% cor</b>	0.1%			39.1%	-2.4%	-3.3%	-1.6%	-0.6%	0.1%	-0.2%	-4.3%	1.3%	-1.9%	10.4%	70.8%	-80.8%	24.5%	3.0%
2004041	<b>52.35</b>			35.5	22.2	24.1	23.4	-	-	-	<b>22.3</b>	<b>22.5</b>	2.9	3.0	4.0	0.8	<b>21.1</b>	<b>20.0</b>
2004041	51.02	<b>CMA</b>		22.9	22.2	24.7	24.0	-	-	-	19.1	24.8	3.6	3.0	4.0	0.8		
<b>52% cor</b>	2.5%			35.4%	-0.3%	-2.4%	-2.5%				14.4%	-9.9%	-23.9%	0.0%	0.0%	0.0%	5.3%	10.3%

4/16/04	<b>91.92</b>
4/15/04	92.10
	-0.2%

Last trade price of underlying asset on most recent trading day  
 Last trade price of underlying asset on previous trading day  
 Percentage change

20040416-16:33:19
20040415-20:26:43
<b>60% correlated</b>

Time of update on the most recent trading day  
 Time of update on the previous trading day  
 Correlation coefficient of the relationship between the asset volatility of IBM and a related equity  
 Ranges between -100% and 100%. Higher values indicate that the volatilities tend to move together.  
 Correlation is studied over the last 252 trading days.

Stock	Monthly Option Volatility					
	Apr-04	May-04	Jul-04	Oct-04	Jan-05	Jan-06
	Mo#1	Mo#2	Mo#3	Mo#4	Mo#5	Mo#6
<b>IBM</b>	31.2	19.0	19.9	20.4	21.4	22.4
	54.5	24.0	21.1	21.1	21.7	22.2
	-74.6%	-26.2%	-6.0%	-3.4%	-1.5%	1.2%

#### Expiration Month

Expiration Month Number

At the money implied volatility at the close of the most recent trading day  
 At the money implied volatility at the close of the previous trading day  
 Percentage change

<b>Market Fit</b>
<b>20bday</b>
<b>18.0</b>
23.5
-30.7%

Implied 20 day at the close  
 Implied 20 day at the previous close  
 Percentage change

<b>Market Fit</b>
<b>Infinite</b>
<b>21.1</b>
18.9
10.4%

Long Term Implied at the close  
 Long Term Implied at the previous close  
 Percentage change

<b>Slope %</b>
<b>S.T.</b>
2.6
5.5

Average Implied Slope at the most recent close of the first 4 expiration months  
 Average Implied Slope at the previous close of the first 4 expiration months  
 Percentage change

<b>Slope %</b>
<b>L.T.</b>
3.1
5.7
-80.5%

Average Implied Slope at the most recent close for expiration months five through eight  
 Average Implied Slope at the previous close for expiration months five through eight  
 Percentage change

<b>Derivative %</b>
<b>S.T.</b>
0.6
-
100.0%

Average Implied Derivative at the most recent close of the first 4 expiration months  
Average Implied Derivative at the previous close of the first 4 expiration months  
Percentage change

<b>Derivative %</b>
<b>L.T.</b>
0.6
-
100.0%

Average Implied Derivative at the most recent close for expiration months five through eight  
Average Implied Derivative at the previous close for expiration months five through eight  
Percentage change

<b>Forecast</b>
<b>vs. Implied 20day</b>
<b>+/- Valuation</b>
<b>18.0</b>
-2.4%

FORECAST of asset volatility for the next 20 trading days

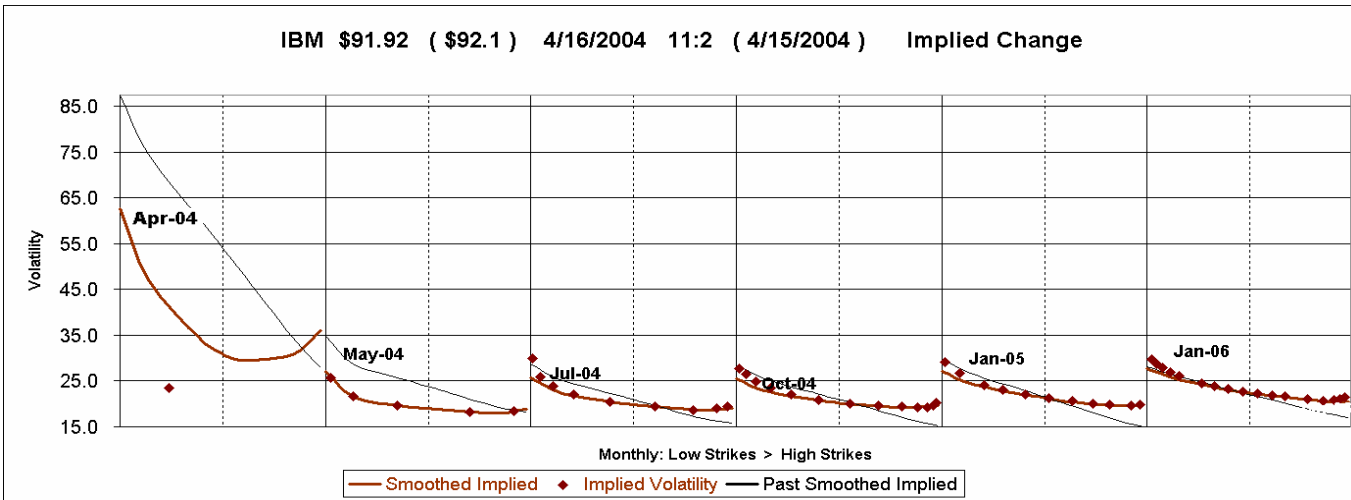
Percentage difference between Implied 20 day and FORECAST.  
Positive percentage indicates implied volatility is trading over the FORECAST

<b>20undVol</b>
<b>vs. Implied 20day</b>
<b>+/- Valuation</b>
<b>12.2</b>
47.9%

20 Day Historical Asset Volatility

Percentage difference between Implied 20 day and 20 Day Volatility  
Negative percentage indicates implied volatility is trading below the recent historical asset volatility

### Smoothed Market Implied Volatilities Graph



#### Legend:

Brown Diamonds: Delta-weighted call and put market implied volatility of each series at the close of the most recent trading day.  
Thick Brown Curve: Smoothed market implied volatility curve at the close of the most recent trading day.  
Thin Black Curve: Smoothed market implied volatility curve at the close of the second most recent trading day.

#### Units:

Vertical Axis: Implied Volatility  
Horizontal Axis: Expiration Month  
Horizontal Sub-Axes: Absolute value of the put delta of each series