IVolatility.com - data and services usage: Advanced Options Page

Today, we will give an extended overview of one of our most popular services - the Advanced Options Page

Advanced Options at a glance

The service has a very simple interface - you enter an instrument symbol and get a report on this instrument and its options. This report contains 4 sections:

- Stock Data
- IV Skew Charts
- Option Data grid
- Implied Volatility and Greeks

The Stock Data section shown below gives basic information on the stock, such as price, volume …etc. and also displays current and several historical snapshots of the IV Index term structure.

Symbol: IBM ALL Go! INTL BUSINESS MACHINES CORP NYSE: IBM Options Root:
AMEX: WIB CBOE: IBM IBW IBZ KAS LIB VIB WCX ZIB ZVB

Price	Change (%)	52 wk High	52 wk Low	Stock volume	Avg. options volume	Avg. options open interest
88.71	-0.84 (-0.94%)	100.19 04-Feb	79.75 06-Aug	4,405,800	17,360	589,260

Implied Volatility Indexes

Term	IV Index %		IVX Change %		IVX Week ago %		IVX Month ago %	
	Call	Put	Call	Put	Call	Put	Call	Put
30 days	20.38	20.40	1.40	0.64	17.18	17.21	17.72	18.06
60 days	17.81	17.94	1.00	0.49	17.25	17.38	19.28	19.18
90 days	18.00	18.21	0.72	0.36	17.32	17.56	19.76	19.73
120 days	18.18	18.44	0.48	0.22	17.39	17.74	20.24	20.29
150 days	18.34	18.60	0.38	0.09	17.71	18.07	20.62	20.76
180 days	18.50	18.75	0.29	-0.05	18.02	18.41	20.72	20.99

Fig. 1. Stock Data section for IBM:NYSE, as of June 28, 2004 close.

You can see that the current snapshot of the IV Index for 60-180-day terms is slightly increasing with term - that is longer term options are more expensive. However the difference is not that large, so a short calendar spread is probably not a very good idea. On the other hand, 30-day IV Index is remarkably higher - so a long calendar spread on July & August or July & October contracts is worth considering.

IV Skew Charts section to the right of the Stock Data just presents two charts: Strike Skew (Implied Volatility vs Strike price) and Time Skew (the same vs days to expiry).

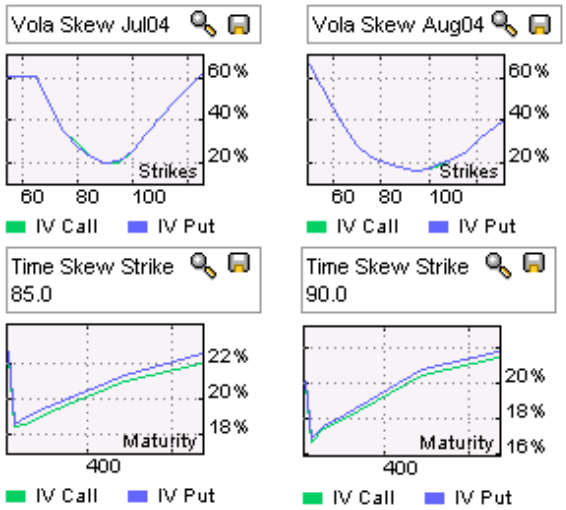

Fig. 2. Strike and Time Skew charts for IBM, as of June 28, 2004 close.

You see that the Strike Skew charts ("volatility smile") for July and August expirations are fairly symmetric - which means that there is no skew between Calls and Puts and the options are fairly liquid. Note that the Time Skew charts (strikes 85 and 90) confirm the IV Index term structure: large Implied Volatility values in the nearest month, then decline in August and then gradual increase again.

A couple of hints on IV Skew Charts section. First, a left click on the chart opens it in a new window of larger size, that's easy. You will get the same result by clicking on the chart link in the 'Expiry' table of the Option Data grid section (see below)

If you're looking for a Time skew chart for some specific strike you will need to adjust a few settings. By default the chart presents the first strike from the Option Data Grid so specifying moneyness is the simplest way. At the moment there is no easy way to specify a strike to be shown in a time skew chart, this feature will be available in our soon-to-be-released follow up to Advanced Options: IVolLive.

In the image below - the Option Data grid shows the most important parameters for each individual contract in the option chain. Among these are option closing bid / ask, volume, open interest, implied volatility and greeks.

Options

ATM | ATM+OTM | ATM+ITM | All | near-the-money % 5

Expiration: All | Call | Put | Call&Put

Go!

Expiry: Jul04 **Days: 19** Jul04 Vola Chart — Download as .CSV file.

Strike		Option Symbol	Bid/Ask Mean	Bid	Ask	Change (%)	Volume	Open Interest	Option Value	Implied Vola%	Delta	Gamma	Theta	Alpha	Vega	Rho
85.0	C	IBMGQ	4.25	4.20	4.30	-0.65 (-13.27)	137	5,952	4.2500	22.25%	0.8108	0.0601	-0.0346	-1.7368	0.0548	0.0352
	P	IBMSQ	0.50	0.45	0.55	0.10 (25.00)	609	19,006	0.5000	22.59%	-0.1927	0.0601	-0.0324	-1.8541	0.0554	-0.0086
90.0	C	IBMGR	1.08	1.05	1.10	-0.33 (-23.21)	3,979	29,935	1.0749	19.86%	0.3896	0.0954	-0.0418	-2.2818	0.0776	0.0174
	P	IBMSR	2.33	2.25	2.40	0.42 (22.37)	1,132	19,652	2.3250	20.08%	-0.6112	0.0955	-0.0394	-2.4233	0.0769	-0.0242

Expiry: Aug04 **Days: 54** Aug04 Vola Chart — Download as .CSV file.

Strike		Option Symbol	Bid/Ask Mean	Bid	Ask	Change (%)	Volume	Open Interest	Option Value	Implied Vola%	Delta	Gamma	Theta	Alpha	Vega	Rho
85.0	C	IBMHQ	4.80	4.70	4.90	-0.60 (-11.11)	58	138	4.8000	18.52%	0.7477	0.0525	-0.0218	-2.4130	0.1100	0.0768
	P	IBMTQ	1.05	1.00	1.10	0.17 (20.00)	805	2,315	1.0500	18.57%	-0.2636	0.0520	-0.0183	-2.8433	0.1126	-0.0328
90.0	C	IBMHR	1.72	1.65	1.80	-0.38 (-17.86)	1,038	5,704	1.7250	16.75%	0.4293	0.0702	-0.0226	-3.1088	0.1338	0.0499
	P	IBMTR	3.03	2.95	3.10	0.40 (15.24)	1,961	2,491	3.0250	16.91%	-0.5778	0.0687	-0.0189	-3.6276	0.1334	-0.0685

Fig. 3. Option Data grid for IBM; two nearest expiries and strikes are shown.

In the next section, we will explain how to use these parameters for trading and risk management purposes.

Finally, there is a very useful feature available for you in the Advanced Options Data page – ability to download data in MS Excel-compatible CSV file (using the "Download" link). Note however, that if you are interested in regular and / or historical data downloads, you'd better use our Data Download Wizard and Daily Updates Wizard services.

Quotes, Volume and Open Interest

Let's first look at the very basic option data - closing bid/ask quote, volume and open interest - see Fig.4. The following information can be extracted from these values:

Bid/Ask - if your trading horizon is short (say, a couple of days to a week), you should carefully examine the bid/ask spread. It is an indicator of an options liquidity, and gives a hints to the slippage incurred. For example, take a look at the unusually large spread of $0.30 for August 90 Calls. The option is close to the money ($87.07 as of Friday's close), but such a spread makes this option unsuitable for "quick profit" opportunity - you will need a relatively large movement in the underlying to cover the slippage.

Volume and **Open Interest** are relevant in liquidity estimates as well. Minor value of volume means that "nobody trades" this contract now, and low open interest tells that "nobody is interested" in the contract at all. Generally, you should avoid options with low trading volume and / or open interest, unless you are completely sure what you are doing.

Finally, **Change** (%) column shows the absolute and relative change in option price from previous close (Thursday's in our case). As the basics of Technical Analysis teach us, the change in price should be confirmed by high volume and open interest, otherwise the price trend will revert soon. However, options are rather complex instruments, so one should not rely on the TA solely.

Expiry: Aug04		Days: 22	Aug04 Vola Chart												Download as .CSV file.
Strike	Option Symbol	Bid/Ask Mean	Bid	Ask	Change (%)	Volume	Open Interest	Option Value	Implied Vola%	Delta	Gamma	Theta	Alpha	Vega	Rho
70.0	C IBMHN	17.05	16.90	17.20	0.20 (1.19)	0	83	17.0900	28.23% *	1.0000	0.0000	-0.0029	-0.0082	0.0000	0.0133
	P IBMTN	0.00	0.00	0.05	0.00 (0.00)	0	2,116	0.0013	28.23% *	-0.0008	0.0004	-0.0004	-1.2216	0.0006	-0.0000
75.0	C IBMHO	12.10	12.00	12.20	0.20 (1.68)	0	286	12.1000	28.23%	0.9959	0.0040	-0.0064	-0.6254	0.0043	0.0163
	P IBMTO	0.00	0.00	0.05	0.00 (0.00)	0	2,773	0.0327	28.23% *	-0.0150	0.0063	-0.0051	-1.2262	0.0081	-0.0008
80.0	C IBMHP	7.10	7.00	7.20	0.20 (2.90)	714	3,204	7.1000	17.20%	0.9937	0.0089	-0.0060	-1.4773	0.0057	0.0172
	P IBMTP	0.12	0.10	0.15	0.00 (0.00)	175	8,680	0.1250	22.26%	-0.0599	0.0250	-0.0126	-1.9854	0.0254	-0.0032
85.0	C IBMHQ	2.53	2.45	2.60	0.12 (5.21)	1,022	21,284	2.5250	15.41%	0.7460	0.1079	-0.0291	-3.7090	0.0690	0.0316
	P IBMTQ	0.60	0.55	0.65	-0.10 (-14.29)	694	12,057	0.6000	16.18%	-0.2762	0.0976	-0.0254	-3.8454	0.0716	-0.0134
90.0	C IBMHR	0.28	0.25	0.30	0.00 (0.00)	946	40,064	0.2750	14.38%	0.1704	0.0826	-0.0183	-4.5220	0.0541	0.0088
	P IBMTR	3.35	3.20	3.50	-0.25 (-6.94)	289	6,868	3.3501	14.90%	-0.8279	0.0840	-0.0161	-5.2040	0.0553	-0.0293
95.0	C IBMHS	0.00	0.00	0.05	0.00 (0.00)	12	8,930	0.0304	17.67% *	0.0220	0.0139	-0.0046	-3.0433	0.0112	0.0011
	P IBMTS	8.10	8.00	8.20	-0.20 (-2.41)	0	1,288	8.1000	17.67%	-0.9843	0.0124	-0.0001	-145.4706	0.0096	-0.0214
100.0	C IBMHT	0.00	0.00	0.05	0.00 (0.00)	0	531	0.0316	26.17% *	0.0161	0.0072	-0.0052	-1.3963	0.0086	0.0008
	P IBMTT	13.10	13.00	13.20	-0.20 (-1.50)	0	509	13.0999	26.17%	-0.9883	0.0064	-0.0004	-16.1108	0.0072	-0.0224
105.0	C IBMHA	0.00	0.00	0.05	0.00 (0.00)	0	40	0.0329	33.98% *	0.0133	0.0047	-0.0057	-0.8305	0.0073	0.0007
	P IBMTA	18.10	18.00	18.20	-0.20 (-1.09)	0	73	18.1000	33.98%	-0.9901	0.0042	-0.0007	-6.2716	0.0059	-0.0234

Fig. 4. IBM nearest expiry (Aug 04) options contracts, 25 % near the money as of 07/30/04 close.

Implied Volatility and Greeks

We've dedicated quite a number of newsletters to the usage of **Implied Volatility** and related indicators, which you may review here. On a very basic level, it is attractive to buy low implied volatility and sell high - as implied volatility is the options cost. One thing to be aware of, is that not all the options have implied vola. We mark the options having a too low or too high implied volatility (outside the 1% ... 250 % range) by an asterisk symbol (*) in Advanced Options. Also, we take the implied volatility figure for them from the other option in the pair, or interpolate it. You should not use this interpolated value in deciding how cheap / expensive the option is. The only purpose for which this value can serve is calculation of the Greeks (and we use it in this way indeed). It is very easy to understand when the implied vola too low (option price close to intrinsic value for ITM option) or too high (high option price for OTM option).

Now, the Greeks shown in Advanced Options are the common ones used for vanilla options: Delta, Gamma, Theta, Alpha, Vega and Rho. We'll give below the definition of each and sketch the information they give for the management of trading risks.

Delta is the sensitivity of an option price to underlying price, which ranges from 0 to 1 for Calls and from -1 to 0 for Puts. It is also a rough estimate of probability for options to expire in-the-money. Buying of cheap low delta options (well below 50 %) on a regular basis would hardly improve your budget, as the odds are not on your side. Buying of large delta (well above 50 %) options cannot be recommended as well, as you will hardly earn more compared to naked stock purchase (or sale for Put). If you look at Fig. 1, you'll see that options with strikes different from 85 and 90 (closest to the money) are scarcely worth trading in front month (August) expiry. For further expiries, more strikes have deltas in the acceptable range, as there is more time left.
Yet another meaning of delta is effective number of shares - holding a Call with 35 % delta is roughly the same as holding 35 shares of the underlying. "Roughly same" stands for "same in the very short term, under minor changes in underlying price and other factors".

Gamma is a sensitivity of Delta to the underlying price. Its other meaning is the sensitivity of an option price to large spot movements. It is "nice and easy" to be long Gamma (having a net positive Gamma), since your profits will be accelerated, and losses - decelerated, in comparison with naked stock position. On the other hand, being short Gamma will decelerate profits and accelerate losses. Of course, such an unpleasant thing is usually compensated by a higher probability of profit and/or larger profit potential. Since all the vanilla options (both Calls and Puts) have positive gammas, the popular strategies of Naked Put or Covered Call writing are short Gamma and therefore risky. For them, the risk is compensated by a large profit probability. But you should look for low gamma options if

employing a naked option sale. The only drawback of being long Gamma is that such a position has negative Theta (wastes away in value over the course of time, all other factors unchanged). This is yet another tradeoff the option trader should be prepared for. We'll dwell in more details when discussing Alpha below.

Theta is a difference between option values tomorrow and today, other factors being equal. All the vanilla options have negative theta and therefore called "wasting assets" (there is a minor exception for European style options, but we will not discuss it here). An option writer hopes that time decay will at least compensate for other factors, and he/she will gain profit due to the option "time decay". As we've seen, the writer pays for this, taking more risk due to negative gamma.

Alpha is a way to compare risks and rewards provided by Gamma and Theta, described above. This value is just a ratio of gamma over theta. It is never positive, so we'll talk about its absolute value in what follows, to make things easier. Large alpha means the selling of the option concerned with large risk - as time decay is not sufficient to compensate the option price advance due to the movement in underlying. By the same reason, low alpha option is hardly a candidate for buying - too large a movement in underlying is needed to compensate the time decay. If you'll have a look at Fig. 1, you'll see a clear "outlier" - alpha of 145 for Aug 95 Put. So is this a best candidate for the naked purchase? Basically, no, as it's large delta of 98.5 % does not make the option attractive at all. So let's look at the options with strikes of 85 and 90, which were determined more or less attractive by delta criterion earlier. They have alphas of about 4-5 - is this high or low ? Interesting to know, that there exists a rough estimate for "fair value" of the alpha, in frames of the commonly used option pricing model (Black-Scholes):

Alpha "fair value" = 2 * 365 / (IV^2 * S^2),

where IV is option contract implied volatility, S - underlying price, and we omitted the minus sign again. Alphas larger than "fair value" are generally attractive for purchase, and lower - for the sale. Table 1 below compares the market value of alphas for 85 and 90 options with their theoretical fair values:

Strike	Call/Put	Symbol	Alpha	Fair Alpha
85	Call	IBMHQ	3.71	4.05
85	Put	IBMTQ	3.85	3.68
90	Call	IBMHR	4.52	4.66
90	Put	IBMTR	5.20	4.34

Tab. 1. Market and theoretical Alpha for near the money IBM August options

It is seen that all the values are close to their theoretical estimates, maybe except Aug 90 Put - considerably larger alpha makes this option an attractive candidate for purchase. But, its delta is still high (83 %), so probably the September Put looks better (delta 71 %, alpha 4.42, theo alpha 3.72)

Vega is the sensitivity of an options price to implied volatility. It is a difference between option price, should implied vola be 1 % (absolute) higher and current market price. It is always positive for vanilla options, both Calls and Puts. There is one good reason to avoid large vegas, as they make your position too sensitive to mispricing of options, be it due to the wrong sentiment on the stock or other reasons. Large Vega makes your position "directional" in volatility, which means that adverse movement in implied volatility will wipe your profits and return them into losses. Of course, near the money options have the largest vegas, and they fade moving towards ITM or OTM. Different spreading strategies are good way to hedge this risk (as well as most risks described above). Employing a spreading strategy with options similar to each other is always a good protection, since they experience similar changes in value and compensate each other.

Finally, **Rho** is a Greek that is rarely taken care of, given low and stable interest rates (risk free rate). It is a difference between option price should interest rate be 1 % higher and current market price. Though, if you are dealing with long-term options (LEAPS), you need to consider this risk and hedge against it properly.

That’s it for today’s overview of Advanced Options. Bringing together stock data, IV charts, options chains, and derivatives analysis, Advanced Options is essential for both monitoring your current positions and exploring new opportunities. Options are complex instruments and options trading can take some fortune. Yet as we all know, fortune favors the prepared.