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Exotic Options On Bloomberg Made Easy

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Exotic Options On Bloomberg - Made Easy

Bloomberg allows clients to quickly and easily analysis, value and save Exotic Options. Offering the advantage of drawing together all the relevant information into the function. (Share price, dividends, interest rates, currency cross-rates etc.)

This guide should help the user through some of the Exotic Options Screens.

OVX and **OVXT** allows the clients to value a whole range of exotic options - this guide is designed to briefly explain what the option is, its benefits and how to enter the option on Bloomberg.

OVX

<HELP> for explanation, <MENU> for similar functions. DL18 Equity **OVX**

EXOTIC OPTION VALUATION	
Enter 1 GO to search for a specific option type 2 GO for an expanded menu of all available option models	
AVAILABLE OPTION CALCULATORS: Enter # GO to select	
3) STANDARD Basic, Vanilla options 4) WARRANT Dilutive, cross currency 5) CROSS-CURRENCY Fixed (Quantos) and Flexible (Flexos) exchange rates 6) EXECUTIVE Employee options (dilutive). 7) ENHANCED Dilutive, cross-currency, caps 8) BARRIER Single, double barriers, Knockouts, Knockins 9) ASIAN (AVERAGE) Arithmetic, geometric Average rate and strike 10) DIGITAL (BINARY) Cash or Nothing, Asset or Nothing	11) LOOKBACK Fixed, floating strike Lookbacks, Ladders 12) SPREAD Two asset spreads, Exchange Options. 13) CHOOSE Simple, Complex 14) COMPOUND Calls on calls, calls on puts Puts on calls, puts on puts 15) POWER Options on a multiple, squared power 16) DIGITAL BARRIER Knockouts, Knockins 17) RATCHET (CLIQUET) 18) RANGE ACCRUAL Daily Accrual Range Trade 19) CROSS-CURRENCY ASIAN 20) TWO COLOR RAINBOW OPTIONS (OVXT)
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<HELP> for explanation, <MENU> for similar functions. DG03 Equity **OVXT**

OVXT

TWO COLOR RAINBOW OPTION VALUATION
1) SPREAD 2) BASKET 3) MAXIMUM/MINIMUM 4) BEST/WORST 5) BINARY 6) DUAL STRIKE 7) PYRAMID/MADONNA
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OVX allows the user to select from a range of options.

<HELP> for explanation, <MENU> for similar functions.

DL18 Equity OVX

EXOTIC OPTION VALUATION	
Enter 1 GO to search for a specific option type	
2 GO for an expanded menu of all available option models	
AVAILABLE OPTION CALCULATORS: Enter # GO to select	
3) STANDARD Basic, Vanilla options	11) LOOKBACK Fixed, floating strike Lookbacks, Ladders
4) WARRANT Dilutive, cross currency	12) SPREAD Two asset spreads, Exchange Options.
5) CROSS-CURRENCY Fixed (Quantos) and Flexible (Flexos) exchange rates	13) CHOOSER Simple, Complex
6) EXECUTIVE Employee options (dilutive).	14) COMPOUND Calls on calls, calls on puts Puts on calls, puts on puts
7) ENHANCED Dilutive, cross-currency, caps	15) POWER Options on a multiple, squared power
8) BARRIER Single, double barriers, Knockouts, Knockins	16) DIGITAL BARRIER Knockouts, Knockins
9) ASIAN (AVERAGE) Arithmetic, geometric Average rate and strike	17) RATCHET (CLIQUET)
10) DIGITAL (BINARY) Cash or Nothing, Asset or Nothing	18) RANGE ACCRUAL Daily Accrual Range Trade
	19) TWO COLOR RAINBOW OPTIONS (OVXT)
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The program can even help the user set up the input screen by allowing the user to refine his Option selection type 2<GO>.

<HELP> for explanation.

DL18 Equity OVX

EXOTIC OPTION VALUATION - EXPANDED MENU	
Enter 1 GO to search for a specific option type	
2 GO to return to the generalized menu	
AVAILABLE OPTION MODELS: Enter # GO to select	
3) STANDARD	12) ENHANCED
4) WARRANT	13) Dilutive
5) Dilutive	14) Cross Currency
6) Cross currency	15) Capped
7) CROSS-CURRENCY	16) BARRIER
8) Quantos (Fixed Rate)	Single Barrier Options
9) Flexos (Floating Rate)	Knockins
10) EXECUTIVE	17) Down-and-in Knock-in
11) Dilutive	18) Up and in Knock-in
	Knock-outs
	19) Down-and-out Knock-out
	20) Up-and-out Knock-out
	Double Barrier Options
	21) Double Knock-in
	22) Double Knock-out
Page for more	
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Eg by typing 17 <GO> to specify a “Down and in Knock-in Barrier” option, the relevant screen will be called up with some of the relevant flags will be pre-set for the user.

Standard Option - One may purchase a standard OTC option, because either a registered option does not exist, or alternatively the expiry and strike needs to be tailored to the clients specification.

In this example the user wishes to value an option that expires at year end.

<HELP> for explanation.

DL23 Equity OVX

Standard Option Valuation			
GLXO LN		GLAXO WELLCOME PLC	
Price of	GLXO LN Equity 1578	Exercise Type:	A-Amer E-Euro CALL
Strike:	1600.000 101.394% (£)	Rate:	7.590% \$
Days to Expiration:	280	Model Type:	1 -Default 3 -Binomial 5 -Square Root 2 -Black/Scholes 4 -Mod. Roll C. E. U.
Trade Date:	3/26/98	Expiration Date:	12/31/98
Settle Date:	3/26/98	Exercise Delay:	0
Option Valuation and Risk Parameters		Dividends	
Price:	200.553 12.709%	Time Value:	200.55339
Volatility:	35.000%	7-Day Decay:	2.75000
Delta:	0.57088	Premium:	14.10351
Gamma:	0.00079	Parity:	-22.00000
Vega:	5.25637	Gearing:	7.86823
		Dividend Yield:	3.19%
		Ex-Date:	4/02/98
		Amount:	16.541
			8/11/98 22.055

The user needs to enter the correct strike price, the expiration date and volatility value. The function will then calculate the theoretical price. (The client can also specify option type, exercise type, dividends etc.)

Page 2 displays a what-if graph.

The option can then

be saved or even sent to a college or client.

Interest rate curve default can be selected using **RDFL**. Dividend assumptions updated by typing 3 <GO> in function or **OPDF** outside the function.

NOTE user can choice IBES consensus forecasts.

Please use this standard option as a benchmark, to compare with the exotic options values.

Warrant - if a warrant (issued by the company) exits, then new shares will be created on exercise of the warrant. The effect of dilution needs to be incorporated in the calculations.

<HELP> for explanation.

DL23 Equity OVX

Warrant Option Valuation			
+GLXO16		GLAXO WELLCOME P Synth. Optn	
Price of	GLXO LN Equity 1578	Exercise Type:	E-Euro CALL
Strike:	1600.000 101.394% (£)	Rate:	7.590% \$
Shares/Warrant:	1.00000	Model Type:	1 -Default 3 -Binomial 5 -Square Root 2 -Black/Scholes 4 -Mod. Roll C. E. U.
Dilutive?:	Y	Option Curr:	BP
Shares Outstanding:	3591.000M	Reinv. Rate:	% BP/BP:
Issue Amount:	30000.0K	Correlation:	% Volatility:
Days to Expiration:	280	Warrant Price Type:	0 -Absolute 1 -Percent of Bonds' Face Amount
Trade Date:	3/26/98	Face Amount:	100
First Exercise:	3/26/98		
Expiration Date:	12/31/98		
Settlement Date:	3/26/98		
Exercise Delay:	0		
Option Valuation and Risk Parameters		Dividends	
Price:	199.838 12.664%	Time Value:	199.83807
Volatility:	35.000%	7-Day Decay:	2.75929
Delta:	0.57008	Premium:	14.05818
Gamma:	0.00079	Parity:	-22.00000
Vega:	5.23935	Gearing:	7.89639
		Wmnt Delta:	0.57008
		Dividend Yield:	3.19%
		Ex-Date:	4/02/98
		Amount:	16.541
			8/11/98 22.055

Note the user now needs to enter a "Y" to say the warrant is dilutive and also enter the issue size of the warrant. Note the option price is fractionally reduced.

If the underlying used is the warrant in question all this information is automatically entered. Note **Executive Options** are treated in a similar

manner.

Cross-Currency Options - these are options that are priced in a different currency to that of the underlying asset. This may be useful if the investor wants the asset priced locally to him. There are two possible options:

Exchange Rate Floating (Flexos) - Payment to be made in the currency of the

<HELP> for explanation. DL23 Equity OVX

Cross-Currency Option Valuation Page 1 of 2
GLXO LN GLAXO WELLCOME PLC

Price of GLXO LN Equity: 1578 Exercise Type: Amer Euro
Put or Call: PUT CALL

Strike: 1600.000 101.394% (£) Rate: 7.590% A B C

Days to Expiration: 280
Trade Date: 3/26/98
Expiration Date: 12/31/98
Settlement Date: 3/26/98
Exercise Delay: 0

Model Type: 1 -Default 2 -Binomial 3 -Square Root
 4 -Black/Scholes 5 -Mod. Roll C. E. U.

Option Curr: US 1-Fixed/2-Float: 2
Reinv. Rate: 5.298 BP/US: 0.597
Correlation: Volatility: 0.597

Option Valuation and Risk Parameters				Dividends	
Value	Percent	Time Value	7-Day Decay	Dividend Yield	Amount
Price: 335.977	12.709	4.60644	14.10351	3.19%	16.541
Volatility: 35.000%		Premium: 14.10351	Parity: -36.85550	Ex-Date	Amount
Delta: 0.95524		Gearing: 7.86823		4/02/98	16.541
Gamma: 0.00132				8/11/98	22.055
Vega: 0.00594					

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option using the exchange rate at exercise.
The function calls the current exchange rate and uses this to value the option in US \$.

Note the price once translated is the same as the standard option. (ie The option is just quoted in another currency but is effectively the same option.) The strike is still in sterling.

Exchange Rate Fixed (Quantos) - Payment is made in currency of option translated at a fixed exchange rate. (ie the specified exchange rate is fixed.)

<HELP> for explanation. DL23 Equity OVX

Cross-Currency Option Valuation Page 1 of 2
GLXO LN GLAXO WELLCOME PLC

Price of GLXO LN Equity: 1578 Exercise Type: Amer Euro
Put or Call: PUT CALL

Strike: 1600.000 101.394% (£) Rate: 7.590% A B C

Days to Expiration: 280
Trade Date: 3/26/98
Expiration Date: 12/31/98
Settlement Date: 3/26/98
Exercise Delay: 0

Model Type: 1 -Default 2 -Binomial 3 -Square Root
 4 -Black/Scholes 5 -Mod. Roll C. E. U.

Option Curr: US 1-Fixed/2-Float: 1
Reinv. Rate: 5.298 BP/US: 0.597
Correlation: 0.500 Volatility: 0.397

Option Valuation and Risk Parameters				Dividends	
Value	Percent	Time Value	7-Day Decay	Dividend Yield	Amount
Price: 320.017	12.410	4.39395	13.80463	3.19%	16.541
Volatility: 35.000%		Premium: 13.80463	Parity: -36.84890	Ex-Date	Amount
Delta: 0.95127		Gearing: 8.05772		4/02/98	16.541
Gamma: 0.00047				8/11/98	22.055
Vega: 8.78872					

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The function again calls up the exchange rate, the relate interest rate, volatility rate, but now the user must specify the correlation between the stock and the exchange rate. (Clearly the user can over-type any of the above, as with any screen.)

Barrier Options - these options are designed to allow the investor to benefit from their expectation of share price path movement, (eg the share will first go down and then "Rocket" up; or the shares going up but never past £20).

There are several types of barriers:

<HELP> for explanation. DL23 Equity OVX

Barrier Option Valuation Page 1 of 2
GLXO LN GLAXO WELLCOME PLC

Price of GLXO LN Equity: 1578 Exercise Type: Amer Euro
Put or Call: PUT CALL

Strike: 1600.000 101.394% (£) Rate: 7.558% A B C

Barrier 1: 2000.000 Rebate 1: 0.000 Barrier Type: 1 2 3
Barrier 2: 0.000 Rebate 2: 0.000 Direction: 1 2 3

Days to Expiration: 280
Trade Date: 3/26/98
Expiration Date: 12/31/98
Settlement Date: 3/26/98
Exercise Delay: 0

Monitoring Frequency: 0
First Mon. Date: 3/26/98
Last Mon. Date: 12/31/98

Option Valuation and Risk Parameters				Dividends	
Value	Percent	Time Value	7-Day Decay	Dividend Yield	Amount
Price: 13.281	0.842	13.28094	-0.41287	3.19%	16.541
Volatility: 35.000%		Premium: 2.23580	Parity: -22.00000	Ex-Date	Amount
Delta: -0.01407		Gearing: 118.81690		4/02/98	16.541
Gamma: -0.00013				8/11/98	22.055
Vega: -0.87832					

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1438-128-0 26-Mar-98 15:55:43

Knockout - if the share price exceeds the barrier the option is "blown out".
In this example the barrier is 2000 and if the share price exceeds this barrier the option ceases. Sometimes the option holder get a rebate if the barrier is past. In this example there is no rebate for the option holder as the rebate is set to 0 (by the user).
The client must enter the

strike, the type of barrier, the barrier level, whether the barrier must be past going up or down and any rebate.

Note the option price is dramatically reduced - therefore if the clients view (that the share will go up but not as high as £20) is correct the investor will make a larger gain.

<HELP> for explanation. DL23 Equity OVX

GLXO LN GLAXO WELLCOME PLC Page 1 of 2

Price of GLXO LN Equity 1578 Exercise Type: Amer Euro Hit 1 GO for save/send screen
 Strike: 1600.000 101.394% Put or Call: Put Call Hit 2 GO for notes
 Rate: 7.590% (£) Hit 3 GO for dividends Hit MENU for exotic option types
 Barrier 1: 1400.000 Rebate 1: 0.000 Barrier Type: 1 - Knockout 3 - Dble Knockout Hit PAGE for scenario graph
 Barrier 2: 0.000 Rebate 2: 0.000 Direction: 1 - Up 2 - Down
 Monitoring Frequency: 0 Decimal number of days
 Days to Expiration: 280
 Trade Date: 3/26/98 First Mon. Date: 3/26/98
 Expiration Date: 12/31/98 Last Mon. Date: 12/31/98
 Settlement Date: 3/26/98
 Exercise Delay: 0

Option Valuation and Risk Parameters				Dividends	
Value	Percent	Time Value	7-Day Decay	Ex-Date	Amount
Price: 59.085	3.744	59.08498	1.84956	4/02/98	16.541
Volatility: 35.000%		5.13846	22.00000	8/11/98	22.055
Delta: -0.21616		26.70729			
Gamma: 0.00076					
Vega: 4.05503					

Hit 4 for hit barrier rate has been adjusted
 barriers 0 - continuous

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 1438-128-0 26-Mar-98 17:55:53

Knockin options only “kick-in” if their barriers are past. Eg If the user believes the stock will go down first and then go up he can reduce his option cost by purchasing a “Down and In” Barrier Option - the option only kicks in if the stock first falls below £1400 (it must then go up to be In-the-money). Note if the stock just went up with out first crossing the barrier the option holder gets nothing (unless there

is a rebate).

Note, the monitoring frequency, dates can be changed, this will impact the option price. Eg if the test to see if the barrier is exceeded is only done once every 14 days (*put 14 in the monitor box*) then the chances of passing the test are lowered and the knock-in option will be cheaper.

Double knockouts are “knocked out” if either barrier is exceeded and Double Knock-ins only “kick in” if either barrier is exceeded.

Asian Options are also very popular - these are averaging option. Most common is to average the share price (or Rate). The pay out is determined by deducting the average from the strike.

<HELP> for explanation. DL23 Equity OVX

GLXO Asian Option Valuation Page 1 of 2
LN GLAXO WELLCOME PLC

Price of GLXO LN Equity 1578 Exercise Type: Amer Euro
Put or Call: CALL Hit 1 GO for save/send screen
Strike: 1600.000 101.394% (£) Rate: 7.598% Hit 2 GO for nlsave
Hit 3 GO for dividends
Hit MENU for exotic option types
Hit PAGE for scenario graph

Average Rate or Strike: R -Rate S -Strike Averaging Method: A -Arithmetic G -Geometric

Days to Expiration: 286 Averaging Frequency: D -Continuous D -Discrete
Trade Date: 3/26/98 Averaging Weighting: W -Weighted U -Unweighted

Expiration Date: 12/31/98

Average Start: 3/26/98 Averaging Points: 10 Hit 4 GO to see average price defaults
Average End: 12/31/98 Average So Far: 1578.00

Settlement Date: 3/26/98
Exercise Delay: 0

Option Valuation and Risk Parameters				Dividends	
Value	Percent	Time Value:	Dividend Yield	Ex-Date	Amount
Price: 109.261	6.924	109.26056	3.19%	4/02/98	16.541
Volatility: 35.000%		7-Day Decay: 3.42524		8/11/98	22.055
Delta: 0.53098		Premium: 8.31816			
Gamma: 0.00136		Parity: -22.00000			
Vega: 3.08059		Gearing: 14.44254			

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1438-128-0 26-Mar-98 16:19:37

This option is far cheaper because the volatility of an average is lower than that of the price itself. (The user still enters the volatility of the share price as normal.) Which is why they appear attractive to the purchaser. (Note, this is balanced by the chance of a

large pay out being reduced => even if some news pushes up the share price the effect will be "diluted" by averaging the price with the earlier lower prices.)

The averaging feature protects the writer and holder from "last minute" sharp spikes or share price movement, and reduces the possibility and impact of manipulation.

The averaging period can be specified by entering averaging start and end, generally this is the same as the life of the option. The user can also specify how the averaging is done Arithmetic (most common) or Geometric. He/she should specify how often the averaging will be done - Continuously once a Day/Week/Month or customised.

<HELP> for explanation. DL23 Equity OVX

GLXO Asian Option Valuation Page 1 of 2

Average Price Defaults
from 3/26/98 to 12/31/98 Page 1 of 1
Daily/Weekly/Monthly Use: Bid/Ask/Last/Mid

Date	Price	Weight	Date	Price	Weight
3/31/98		1.000	/	/	/
4/30/98		1.000	/	/	/
6/1/98		1.000	/	/	/
6/30/98		1.000	/	/	/
7/31/98		1.000	/	/	/
9/1/98		1.000	/	/	/
9/30/98		1.000	/	/	/
11/2/98		1.000	/	/	/
11/30/98		1.000	/	/	/
12/31/98		1.000	/	/	/

Price: 109.261 Volatility: 35.000% Delta: 0.53098 Gamma: 0.00136 Vega: 3.08059

Dividends: 3.19% Ex-Date: 4/02/98 Amount: 16.541 8/11/98 22.055

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1438-128-0 26-Mar-98 16:20:10

For Discrete enter "D" and then enter 4 <GO>. The pop-up menu then allows the user to specify frequency, dates and even weightings. (In practise most options will equally weighted.)

Note the weekly/monthly averaging points are worked out from the averaging period in this case end of the month (or next day if date is a weekend).

It is also possible to average the strike price. This gives the holder the right to purchase the share at the average price (over the averaging time period.) Set the averaging to Strike.

<HELP> for explanation. DL23 Equity OVX

GLXO Asian Option Valuation Page 1 of 2
LN GLAXO WELLCOME PLC

Price of GLXO LN Equity 1578 Exercise Type: Amer Euro Hit 1 GO for save/send screen
Put or Call: CALL Hit 2 GO for notes
Strike: 1600.000 101.394% (£) Rate: 7.590% \$ Hit 3 GO for dividends
Hit MENU for exotic option types
Hit PAGE for scenario graph
A-Ann S-Semi C-Cont NOTE: Riskfree rate has been adjusted

Average Rate or Strike: R -Rate S -Strike Averaging Method: A -Arithmetic G -Geometric

Days to Expiration: 280 Averaging Frequency: C -Continuous D -Discrete
Trade Date: 3/26/98 Averaging Weighting: W -Weighted U -Unweighted
Expiration Date: 12/31/98
Average Start: 3/26/98 Averaging Points: 10 Hit 4 GO to see average price defaults
Average End: 12/31/98 Average So Far: 1578.00
Settlement Date: 3/26/98
Exercise Delay: 0

Option Valuation and Risk Parameters				Dividends	
Value	Percent	Time Value		Ex-Date	Amount
Price: 117.058	7.418	7-Day Decay: 0.11943	Dividend Yield	3.19%	
Volatility: 35.000%	Premium: 8.81227	Parity: -22.00000	Ex-Date	Amount	
Delta: 0.07418	Gearing: 13.48055		4/02/98	16.541	
Gamma: -0.00000			8/11/98	22.055	
Vega: 2.99288					

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1438-128-0 26-Mar-98 18:20:41

At expiry the holder can purchase the share at the average price over the averaging period. As the strike is set to this value.

This is an attractive feature, which again coupled with the lower option price makes this

option fairly popular.

Look Back Options allow the holder to look back over the Look Back period and pick the most advantageous value. In the example shown the holder can look back

<HELP> for explanation. DL23 Equity OVX

GLXO Lookback Option Valuation Page 1 of 2
LN GLAXO WELLCOME PLC

Price of GLXO LN Equity 1578 Exercise Type: Amer Euro Hit 1 GO for save/send screen
Put or Call: CALL Hit 2 GO for notes
Strike: 1600.000 101.394% (£) Rate: 7.590% \$ Hit 3 GO for dividends
Hit MENU for exotic option types
Hit PAGE for scenario graph
A-Ann S-Semi C-Cont NOTE: Riskfree rate has been adjusted

Fixed or Floating Strike: 1 -Float 2 -Fixed

Lookback or Ladder: 1 -Lookback 2 -Ladder

Days to Expiration: 280
Trade Date: 3/26/98
Expiration Date: 12/31/98
First Lookback Dt: 3/27/98
Last Lookback Dt: 12/31/98
Settlement Date: 3/26/98
Exercise Delay: 0

Minimum so far: 1578
Percent of Minimum to use: 100.000%

Monitoring Frequency: 0 Decimal number of days between monitoring
lookback 0 -Continuous

Option Valuation and Risk Parameters				Dividends	
Value	Percent	Time Value		Ex-Date	Amount
Price: 358.489	22.718	7-Day Decay: 0.71966	Dividend Yield	3.19%	
Volatility: 35.000%	Premium: 24.11210	Parity: -22.00000	Ex-Date	Amount	
Delta: 0.26483	Gearing: 4.40181		4/03/98	16.541	
Gamma: 0.00101			8/11/98	22.055	
Vega: 8.58458					

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over the life of the option and chose the lowest share price as the strike. Effectively he can purchase the shares at the low.

This is a very attractive but the option price is consequently higher. The user specifies that the strike is floating, specifies the "Look Back" period, the monitoring frequency

and the fact the option is a Look Back (and not a Ladder).

There is even the capability to use a percentage of the minimum price.

By changing the Strike to Fixed the option is changed such that the holder can chose

<HELP> for explanation. DDL23 Equity OVX

Lookback Option Valuation Page 1 of 2
GLXO LN GLAXO WELLCOME PLC

Price of GLXO LN Equity 1578 Exercise Type: A-Amer E-Euro
Put or Call: CALL

Strike: 1600.000 101.394% (£) Rate: 7.590% A-Rnn S-Semi C-Cont

Fixed or Floating Strike: 1 -Float 2 -Fixed

Lookback or Ladder: 1 -Lookback 2 -Ladder

Days to Expiration: 280
Trade Date: 3/26/98
Expiration Date: 12/31/98
First Lookback Dt: 3/27/98
Last Lookback Dt: 12/31/98
Settlement Date: 3/26/98
Exercise Delay: 0

Maximum so far: 1578
Percent of Maximum to use: 100.000%

Monitoring Frequency: 0 Decimal number of days between monitoring
lookback 0 -Continuous

Option Valuation and Risk Parameters				Dividends	
Value	Percent	Time Value	Dividend Yield	Ex-Date	Amount
Price: 428.584	22.160	428.58377	3.19%	4/03/98	16.541
Volatility: 35.000%		7-Day Decay: 21.74562		8/11/98	22.055
Delta: 0.21100		Premium: 28.55410			
Gamma: 0.00114		Parity: -22.00000			
Vega: 12.54328		Gearing: 3.68189			

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1438-128-0 27-Mar-98 10:58:06

the highest price over the Look Back period and receive the difference between this and the strike. (The strike price is fixed, but the share price is floating.)

Again this ability to look back and choose the most advantageous price is attractive, but this will be reflected in cost of the option.

Ladders are similar to Lookbacks but the look back effectively works in steps.

<HELP> for explanation. DDL23 Equity OVX

Lookback Option Valuation Page 1 of 2
+GLXO16 GLAXO WELLCOME P Synth. Optn

Price of GLXO LN Equity 1578 Exercise Type: A-Amer E-Euro
Put or Call: CALL

Strike: 1600.000 101.394% (£) Rate: 7.590% A-Rnn S-Semi C-Cont

Fixed or Floating Strike: 1 -Float 2 -Fixed

Lookback or Ladder: 1 -Lookback 2 -Ladder

Days to Expiration: 280
Trade Date: 3/26/98
Expiration Date: 12/31/98
First Lookback Dt: 4/1/98
Last Lookback Dt: 12/31/98
Settlement Date: 3/26/98
Exercise Delay: 0

Minimum so far: 1578
Percent of Minimum to use: 100.000%

Monitoring Frequency: 0 Decimal number of days between monitoring
lookback 0 -Continuous

Option Valuation and Risk Parameters				Dividends	
Value	Percent	Time Value	Dividend Yield	Ex-Date	Amount
Price: 301.029	19.077%	301.02924	3.19%	4/08/98	16.541
Volatility: 35.000%		7-Day Decay: 2.79461		8/11/98	22.055
Delta: 0.35839		Premium: 20.47080			
Gamma: 0.00070		Parity: -22.00000			
Vega: 6.94411		Gearing: 5.24202			

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1438-128-0 01-Apr-98 12:24:22

<HELP> for explanation. DDL23 Equity OVX
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Lookback Option Valuation Page 1 of 2
+GLXO16 GLAXO WELLCOME P Synth. Optn

Price of GLXO LN Equity 1578 Exercise Type: A-Amer E-Euro

Strike: Fixed or Floating Strike: 1 -Float 2 -Fixed

Lookback or Ladder: 1 -Lookback 2 -Ladder

Days to Expiration: 280
Trade Date: 3/26/98
Expiration Date: 12/31/98
First Lookback Dt: 4/1/98
Last Lookback Dt: 12/31/98
Settlement Date: 3/26/98
Exercise Delay: 0

Minimum so far: 1578
Percent of Minimum to use: 100.000%

Monitoring Frequency: 0 Decimal number of days between monitoring
lookback 0 -Continuous

Ladder Level Defaults			
Number of ladder levels:	1600	1500	1400
Days to Exp	280	280	280
Trade Date	3/26/98	3/26/98	3/26/98
Expiration	12/31/98	12/31/98	12/31/98
First Lookback	4/1/98	4/1/98	4/1/98
Last Lookback	12/31/98	12/31/98	12/31/98
Settlement	3/26/98	3/26/98	3/26/98
Exercise Delay	0	0	0

Option Valuation and Risk Parameters				Dividends	
Value	Percent	Time Value	Dividend Yield	Ex-Date	Amount
Price: 301.029	19.077%	301.02924	3.19%	4/08/98	16.541
Volatility: 35.000%		7-Day Decay: 2.79461		8/11/98	22.055
Delta: 0.35839		Premium: 20.47080			
Gamma: 0.00070		Parity: -22.00000			
Vega: 6.94411		Gearing: 5.24202			

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In the above example the strike price will be changed to 1500 if the share price falls below 1500 (during the monitor period). If the price subsequently falls below 1400 this then becomes the new strike etc. (If the share price fell to 1401 and then rises again then the strike remains at 1500.) This option is slightly less advantageous than straight Lookbacks, for this reason and consequently valued as such 301p v 358.5p.

<HELP> for explanation. DL23 Equity OVX

+GLXO16 Chooser Option Valuation Page 1 of 2
GLAXO WELLCOME P Synth. Optn

Price of GLXO LN Equity 1578

Call Strike: 1600.00 (£) Rate: 7.500%
Put Strike: 1600.00

Trade Date: 3/26/98
Settlement Date: 3/26/98

Choice Date: 9/16/98
Exercise Type of chosen option: A - American
E - European

Days to Exp. of Call: 200 Days to Exp. of Put: 200
Expir. Date of Call: 12/31/98 Expir. Date of Put: 12/31/98
Settle Date of Call: 9/16/98 Settle Date of Put: 9/16/98
Exercise Delay of Chosen Option: 1

Option Valuation and Risk Parameters				Dividends	
Price:	35.000%	Time Value:	333.18204	Dividend Yield:	3.19%
Volatility:	35.000%	7-Day Decay:	5.00399	Ex-Date:	Amount:
Delta:	0.17689	Premium:	22.50837	4/08/98	16.541
Gamma:	0.00179	Parity:	-22.00000	8/11/98	22.055
Vega:	9.40559	Gearing:	4.73615		

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1438-128-0 01-Apr-98 12:36:30

Chooser options give the holder the right to wait and choose whether the option is a Call or Put. The user needs to input the choice date, at this point time the option holder must decide whether to take a Call or Put. Clearly this allows the user to win if share goes up or down and therefore is more attractive than a straight Option and consequently priced accordingly.

<HELP> for explanation. DL23 Equity OVX

GLXO LN Compound Option Valuation Page 1 of 2
GLAXO WELLCOME PLC

Price of GLXO LN Equity 1578 Put or Call: CALL

Compound Strike: 300.00 (£) Rate: 7.500%

Days to Expiration: 90 Underlying Option: Put or Call: CALL
Trade Date: 3/26/98 Set Date: 6/30/98 Strike: 1600.000
Expiration Date: 6/30/98 Expiration: 12/31/98 Exercise Type: E
Settlement Date: 3/26/98 Exercise Delay: 0

Option Valuation and Risk Parameters				Dividends	
Price:	35.639%	Time Value:	35.63883	Dividend Yield:	3.99%
Volatility:	35.000%	7-Day Decay:	3.13701	Ex-Date:	Amount:
Delta:	0.23505	Premium:	3.65265	4/08/98	16.541
Gamma:	0.00100	Parity:	-22.00000		
Vega:	2.99797	Gearing:	44.27755		

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1438-128-0 01-Apr-98 12:36:30

Compound Option is an option on an option. In this case, the holder has an Call option that expires 30th June to purchase a Call option for £3.00 which will then give the holder the right to purchase the shares at £16.00 on 31st December. The holder pays less up-front initially making this a highly geared instrument. However, the over-all cost (including the first strike) will be higher.

<HELP> for explanation. DL23 Equity OVX

GLXO LN Digital Option Valuation Page 1 of 2
GLAXO WELLCOME PLC

Price of GLXO LN Equity 1578 Exercise Type: A - Asset or Nothing
Put or Call: CALL

Strike: 1600.000 101.353%
Second Strike: 1600.000 101.394%
(Supershares, Superfunds, & caps only)

Days to Expiration: 280 Digital Type: C - Cash or Nothing A - Asset or Nothing
Trade Date: 3/26/98 S - Supershare F - Superfund
Expiration Date: 12/31/98 G - Gap
Settlement Date: 3/26/98
Exercise Delay: 0

Payout at Exercise: 10.00

Option Valuation and Risk Parameters				Dividends	
Price:	4.937%	Time Value:	4.37695	Dividend Yield:	3.19%
Volatility:	35.000%	7-Day Decay:	-0.00530	Ex-Date:	Amount:
Delta:	-0.00776	Premium:	1.67154	4/08/98	16.541
Gamma:	-0.00000	Parity:	-22.00000	8/11/98	22.055
Vega:	-0.02283	Gearing:	360.53299		

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1438-128-0 01-Apr-98 13:12:38

Digital Options, user must specify which type - in this case “**Cash or Nothing**” the holder gets the stated pay-off, if the strike price is exceeded or nothing. (In this case the second strike is not used.) “**Asset or Nothing**” means that the asset is handed over if strike is broken. (See help for other descriptions.)

Two Security Options - GLXO LN <Equity> SB/ LN <Equity> OVXT

Spread Options allow the holder to specify a relative view between two assets, (remember most Fund Managers spend their time doing this). Eg Glaxo will outperform his/her benchmark (say the FTSE 100), or that it will outperform their competitor, etc. In Corporate situations the option can also help back a view (eg the merger will go through or not).

```

<HELP> for explanation.
DG03 Equity OVXT

Spread Option Valuation
GLXO LN Equity
GLAXO WELLCOME PLC
Price: 1541
Weight: 1.0000
Dividend Yield: 3.7363%
Volatility: 35.0000%

SB/ LN Equity
SMITHKLINE BEECHAM PLC
Price: 750
Weight: 2.1592
Dividend Yield: 0.8092%
Volatility: 40.0000%

Correlation: 0.7289
Spread: 0.0080
Strike: 100.0000

Information about: 1
1 - Legs 2 - Spread

Days to Expiration: 274
Trade Date: 4/ 1/98
Expiration Date: 12/31/98
Settle Date: 4/ 1/98
Exercise Delay: 0

Model Type: 3
1 - Black Scholes
2 - Normal
3 - Double Log

Exercise Type: E
A - Amer
E - Euro

Put or Call: CALL
(BP) Rate: 7.598%
A - Ann
S - Semi
C - Cont

Calculate: 0
0 - Option Price
1 - Volatility 1
2 - Volatility 2

Option Price: 97.6621
Time Value: 97.6621
7-Day Decay: 1.5224

Delta: 0.3142
Gamma: 0.0009 -0.0020
Vega: -58.3347

Delta: 0.8873
Gamma: -0.0020 0.0046
Vega: -57.0056

Hit 1 GO for save screen
Hit 2 GO for notes
Hit MENU for exotic option types
Hit PAGE for scenario graph

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1438-128-0 01-Apr-98 13:36:42
    
```

In this example the purchaser believes that Glaxo will now out-perform SmithKline Beecham. Note the weightings for SmithKline has been changed (by the user) to give a spread of about zero. It is on this spread that the option is based. The option price is being calculated from the volatility of each share and the correlation. (Note, one can calculate the share volatility back from the option price, the correlation and the other shares volatility.

By paging forward the user can see the impact of say the option price (on different dates) as say the correlation changes.

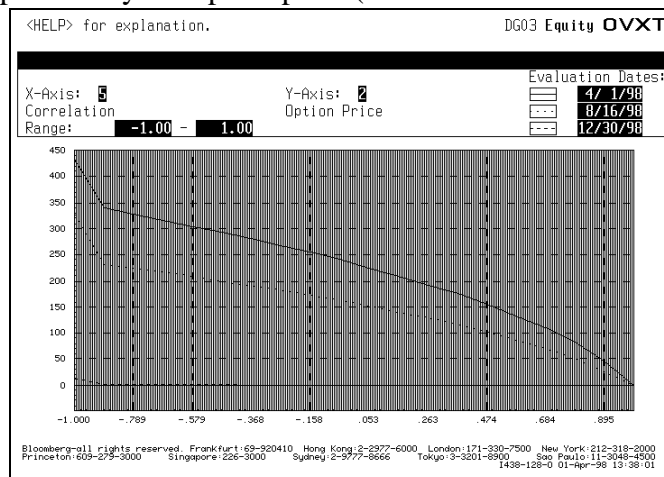
```

<HELP> for explanation.
DG03 Equity OVXT

X-Axis: 1 Y-Axis: 1 Evaluation Dates:
Price of 4/ 1/98
Range: 5/16/98
6/29/98

Enter fields and hit <GO>
for scenario graph

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1438-128-0 01-Apr-98 13:36:42
    
```



Basket Options allow the user to value a basket of 2 stocks, (use CIX for larger baskets). (Also see OVB).

```

<HELP> for explanation.                                DG03 Equity OVXT
-----
Basket Option Valuation
-----
GLXO LN Equity          SB/ LN Equity
GLAXO WELLCOME PLC     SMITHKLINE BEECHAM PLC
Price: 1641             Price: 760
Weight: 1.0000         Weight: 2.1592
Dividend Yield: 3.7363% Dividend Yield: 0.8092%
Volatility: 35.0000%   Volatility: 40.0000%
Correlation: 0.7289
Basket value: 3281.9920
Strike: 2401.0000      73.157%

Days to Expiration: 274          Calculate: 0
Trade Date: 4/ 1/98             0 - Option Price
Expiration Date: 12/31/98       Exercise Type: 1 - Volatility 1
Settle Date: 4/ 1/98           Put or Call: CALL 2 - Volatility 2
Exercise Delay: 0               (BP) Rate: 7.590%
Option Price: 1005.4050         Time Value: 124.4938 7-Day Decay: 3.5826
Delta: 0.8767                  Delta: 1.9512
Gamma: 0.0002 0.0004          Gamma: 0.0004 0.0008
Vega: 2.2293                  Vega: 2.1809

Hit 1 GO for save screen      Hit MENU for exotic option types
Hit 2 GO for notes           Hit PAGE for scenario graph
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1438-128-0 01-Apr-98 13:45:02
  
```

Maximum Options will allow the holder to choose the maximum pay-out between the two assets.

```

<HELP> for explanation.                                DG03 Equity OVXT
-----
Maximum/Minimum Option Valuation
-----
GLXO LN Equity          SB/ LN Equity
GLAXO WELLCOME PLC     SMITHKLINE BEECHAM PLC
Price: 1641             Price: 760
Weight: 1.0000         Weight: 2.1592
Weighted Value: 1641.0000    Weighted Value: 1640.9920
Dividend Yield: 3.7363%   Dividend Yield: 0.8092%
Volatility: 35.0000%   Volatility: 40.0000%
Correlation: 0.7289
Strike: 1641.0000      100.000%

Days to Expiration: 274          Option on: 1 - Maximum
Trade Date: 4/ 1/98             2 - Minimum          Calculate: 0
Expiration Date: 12/31/98       Exercise Type: 1 - Volatility 1
Settle Date: 4/ 1/98           Put or Call: CALL 2 - Volatility 2
Exercise Delay: 0               (BP) Rate: 7.590%
Option Price: 332.7160         Time Value: 332.7160 7-Day Decay: 4.6503
Delta: 0.3271                  Delta: 0.9522
Gamma: 0.0005 -0.0006          Gamma: -0.0006 0.0022
Vega: 3.3798                  Vega: 4.5660

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Hit 2 GO for notes           Hit PAGE for scenario graph
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1438-128-0 01-Apr-98 13:49:14
  
```

In this case the pay-out will be based on the maximum of 1 Glaxo share and 2.1592 SmithKline Beecham shares, minus the strike price (1641p).

This gives the holder two shots of getting a good pay-out.

Clearly **Minimum** is the lowest pay-out of the two. (Therefore it is cheaper.)

Best Option will pay the maximum between your 2 stocks and a pre-set cash amount.
Dual Binary options will pay a pre-set cash pay-out if both stocks exceed their associated strikes, else the holder receives nothing.

Please try the other options yourself and look at the help for further information.

And if you have additional questions hit <Help> twice.

PS we are always looking to improve and update the system so let us know if there are any options you would like us to cover. Type SVY for user suggestion. Thank You.