

BLOOMBERG DERIVATIVE INFORMATION AND FUNCTIONS

E2 SPOT EQUITY OPTIONS

To access a listing of current options on a company, you first enter the company's ticker followed by the [EQUITY] key. As noted, this will bring up a menu of information and data sources than can be accessed on the selected stock, as well as analytical functions. The menu includes:

1. Today's Market's – Quotes and Recaps
2. Company Information
3. Historical Prices
4. News
5. Fundamentals and Earning Analysis
6. Option, Warrants, and Convertibles

To access options on the stock, you click the “Options, Warrants, & Convertibles” selection on the menu (or type in the number 6). This will bring up a menu of option data and analytics that you can access. From this menu, current market information on exchanged-listed options on the selected stock can be accessed by clicking OMON (number 2). For example, to access options on IBM, you would:

- Enter IBM [EQUITY]
- Click “Options, Warrants & Convertibles” on the resulting IBM Menu Screen
- On Options, Warrants & Convertibles Screen, click “OMON”

You also can access IBM options information directly by typing IBM [EQUITY] OMON. The OMON screen for IBM is shown in Exhibit E.2-1.

Exhibit E.2-1: OMON

Template List						Edit						Contract Months						Security List						IBM US Equity					
IBM US \$ sC 97.42 -.89 N --x-- sho Equity OMON Cancel: Screen not saved																													
Option Monitor: INTL BUSINESS MACHINES CORP Center <input type="text" value="97.42"/> Number of Strikes <input type="text" value="9"/> -or- <input type="checkbox"/> % from Center Exchange <input type="text" value="C"/> (Composite)																													
Ticker	Strike	Bid	Ask	Last	Volume	Ticker	Strike	Bid	Ask	Last	Volume	Ticker	Strike	Bid	Ask	Last	Volume	Ticker	Strike	Bid	Ask	Last	Volume						
IBM 20 JAN 07 (Contract Size: 100)												IBM 20 JAN 07 (Contract Size: 100)																	
1) IBM+AQ	85.00	12.60	12.80	12.70	y 180	16) IBM+MQ	85.00	.05	.05	.03	y 500	21) IBM+NQ	85.00	.05	.15	.15	y 512	26) IBM+PQ	85.00	.40	.50	.45	y 52						
2) IBM+AR	90.00	7.70	7.90	8.00	y 899	17) IBM+MR	90.00	.15	.20	.15	y 540	22) IBM+NR	90.00	.35	.45	.40	y 590	27) IBM+PR	90.00	.95	1.05	1.00	y 38						
3) IBM+AS	95.00	3.50	3.60	3.60	y 1766	18) IBM+MS	95.00	.85	.90	.85	y 4554	23) IBM+NS	95.00	1.35	1.45	1.35	y 447	28) IBM+PS	95.00	2.20	2.30	2.20	y 65						
4) IBM+AT	100.00	.95	1.05	1.05	y 5436	19) IBM+MT	100.00	3.30	3.40	3.20	y 496	24) IBM+NT	100.00	3.80	3.90	3.90	y 336	29) IBM+PS	95.00	2.20	2.30	2.20	y 65						
5) IBM+AA	105.00	.15	.25	.25	y 1696	20) IBM+MA	105.00	7.50	7.70	7.80	y 32	25) IBM+NA	105.00	7.70	7.80	7.00	y	30) IBM+PT	100.00	4.50	4.70	4.60	y 80						
IBM 17 FEB 07 (Contract Size: 100)												IBM 17 FEB 07 (Contract Size: 100)																	
6) IBM+BO	85.00	12.80	13.00	12.70	y 60	21) IBM+NQ	85.00	.05	.15	.15	y 512	26) IBM+PQ	85.00	.40	.50	.45	y 52												
7) IBM+BR	90.00	8.10	8.30	8.20	y 8	22) IBM+NR	90.00	.35	.45	.40	y 590	27) IBM+PR	90.00	.95	1.05	1.00	y 38												
8) IBM+BS	95.00	4.10	4.20	4.30	y 163	23) IBM+NS	95.00	1.35	1.45	1.35	y 447	28) IBM+PS	95.00	2.20	2.30	2.20	y 65												
9) IBM+BT	100.00	1.50	1.60	1.60	y 3024	24) IBM+NT	100.00	3.80	3.90	3.90	y 336	29) IBM+PS	95.00	2.20	2.30	2.20	y 65												
10) IBM+BA	105.00	.35	.45	.40	y 1624	25) IBM+NA	105.00	7.70	7.80	7.00	y	30) IBM+PT	100.00	4.50	4.70	4.60	y 80												
IBM 21 APR 07 (Contract Size: 100)												IBM 21 APR 07 (Contract Size: 100)																	
11) IBM+DO	85.00	13.80	13.90	13.90	y 40	26) IBM+PQ	85.00	.40	.50	.45	y 52	31) IBM+RQ	85.00	.05	.15	.15	y 512												
12) IBM+DR	90.00	9.40	9.60	9.50	y 564	27) IBM+PR	90.00	.95	1.05	1.00	y 38	32) IBM+RS	90.00	8.10	8.30	8.20	y 8												
13) IBM+DS	95.00	5.70	5.90	5.80	y 193	28) IBM+PS	95.00	2.20	2.30	2.20	y 65	33) IBM+ST	100.00	3.00	3.10	3.00	y 330												
14) IBM+DT	100.00	3.00	3.10	3.00	y 330	29) IBM+PS	95.00	2.20	2.30	2.20	y 65	34) IBM+TT	100.00	3.00	3.10	3.00	y 330												

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The Bloomberg OMON Screen for IBM options shows the call and put options traded on IBM stock at the time the option is accessed, along with price and volume information on the stock. The screen in Exhibit E.2-1 was accessed on January 6, 2007. It shows IBM trading at 97.42, along with price and volume information on IBM call and put options broken down into five exercise prices and three expiration months. For example, line 8 shows the IBM call with an exercise price of 95 and expiration of February 7, 2007 trading a 4.10 (bid) and 4.20 (ask), and line 23 shows the IBM January 95 put trading at 1.35 (bid) and 1.45 (ask). The OMON Screen, in turn, can be customized to show other descriptive information about the option. For example, more options can be accessed by changing the number of strikes and the contract months (top box in the middle). IBM options can also be selected based on exchange listings by using the exchange key (top right).

A number of functions can be applied to all of the listed stock options. To access a function, you type in the function's identifier on the OMON Screen (many of these functions are discussed in this appendix). For example, to analyze one or more of the IBM options in terms of profit tables and graphs, you type in OSA. This brings up the OSA Screen for IBM options where you can generate profit tables and graphs for selected portfolio positions formed with IBM stock and the options traded on it.

To obtain information on a specific option shown on the OMON Screen, you set your cursor on the option of interest and left click. This will bring up the following menu of information and analytics that you can access or apply to that option:

- **DES** gives a description of the option
- **QRM** gives a trade recap
- **TSM** gives a trade matrix
- **GIP** is an intraday price graph
- **GPO** gives a bar chart
- **OV** is the option valuation screen
- **OVX** is exotic option valuation screen

In evaluating options, two useful Bloomberg functions are the OSA function for evaluating option strategies and the OV function for valuing a specific option using an option pricing model.

OSA – Generating Profit Tables

As noted, the OSA function allows you to evaluate an option portfolio formed with the options and its underlying stock. To access: enter Company's Ticker [EQUITY]; on the Company menu screen, click "Options, Warrants, & Convertible; on the Options, Warrants, & Convertible Screen, click OSA (23)). The OSA function for a stock can also be accessed directly by simply entering "Company's Ticker [EQUITY] OSA. For example, to access IBM's OSA Screen: Enter IBM [EQUITY] OSA. The OSA Screen for the IBM options (Exhibit E.2-1) is shown in Exhibit E.2-2.

Exhibit E.2-2: OSA Screen Exhibit

<HELP> for explanation, <MENU> for similar functions. dgp Equity OSA

Add Options															
Import	Source	Columns	Save	Delete Mode	OPSA										
Base Currency:	USD	Total P&L:	0.00	Add Security:											
Security:	IBM US Equity	Price:	97.42	Position:	0.00	Cost:	97.42	P&L:	0.00	Delta:	0.00	Theta:	0.00	Vega:	0.00
Scenarios For: IBM US Equity Defaults P&L From: Portfolio Adjusted															
Price	Vol.	Date	Rate	P&L	P&L(%)	Delta	Gamma	Theta	Vega						
1) 105.00	0.00	01/13/07	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
2) 100.00	0.00	01/13/07	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
3) 95.00	0.00	01/13/07	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
4) 90.00	0.00	01/13/07	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
5) 85.00	0.00	01/13/07	0.00	0.00	0.00	0.00	0.00	0.00	0.00						

E.2-3: OSA Screen: Option Inputs

<HELP> for explanation. dgp Equity OSA

Screen saved as U:\Derivative Book Chapters\Bloomberg Text\Bloomberg tables\OSA

Security: IBM US Equity Contract Month: 4/2007 Price: 97.42

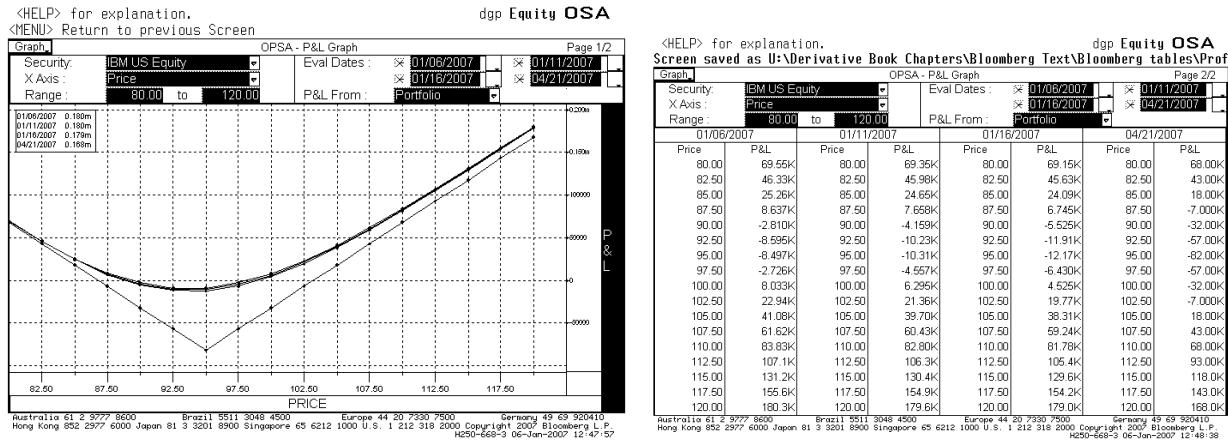
CALLS					PUTS					
Bid	Ask	Last	Cost	Pos.	Strike	Bid	Ask	Last	Cost	Pos.
67.50	67.70				30.00				.05	
62.50	62.90	62.60			35.00				.05	
57.60	58.00				40.00				.05	
52.70	52.90				45.00				.05	
47.80	48.10	47.80			50.00				.05	
42.90	43.10				55.00				.05	
37.90	38.30				60.00				.05	
33.00	33.40	33.10			65.00				.05	
28.10	28.50	28.20			70.00				.10	.05
23.20	23.60				75.00		.05	.15		
18.40	18.60	18.18			80.00		.15	.25		
13.80	13.90	13.90			85.00		.40	.50	.45	
9.40	9.60	9.50			90.00		.95	1.05	1.00	
5.70	5.90	5.80	5.90	100.00	95.00	2.20	2.30	2.20	2.30	100.00
3.00	3.10	3.00			100.00	4.50	4.70	4.60		
1.35	1.45	1.40			105.00	8.00	8.20	8.30		
.55	.65	.55			110.00	12.50	12.70	12.60		
.20	.25	.30			115.00	17.40	17.70			
.05	.15				120.00	22.40	22.70			

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The OSA Screen in Exhibit E.2-2 shows IBM stock trading at 97.42. In constructing option portfolios on this screen, you can include the stock in your portfolio by inputting the number of shares in the position box (e.g., 100 shares (long) or -100 shares (short)). To include options on the stock, you click the “Add Options” key (top left corner). This brings up the OSA Screen for inputting currently traded options (see Exhibit E.2-3). On the OSA Screen for inputting option positions, you first need to select the option selection months (“Contract Month”). This will bring up a screen with all options with those selected expirations and exercises prices. You can then input the number of puts options and call options in the position column (“Pos.”). The cost of the option will default to the current option price. You can keep this price or input your own. In the OSA Screen shown in Exhibit E.2-3, 100 IBM calls with an exercise price of 95 and expiration of 4/2007 purchased as the ask price of 5.90 and 100 IBM puts with an exercise price of 95 purchased at the ask price of 2.30 were selected. Typing 1 and pressing <go> takes you back to the portfolio screen where you can now see the loaded portfolio position.

Given your selected option position, you next press the “Graph” button to see the option position’s profit graph and table, as well as the market value and volatility information. On the profit table and graphs, profit and stock price relations are shown for the option position for different holding periods and expirations. The option prices prior to expiration are based on defaulted OPM values and dividend yield. To see the model and dividend assumptions or to change to another option model and dividend, click the “default” button on the OSA screen. On the graph screen, you also can change the range of stock prices and the evaluation dates. Exhibit E.2-4 shows the resulting OSA profit graph and table for the selected IBM straddle position shown in Exhibit E.2-3.

Exhibit E.2-4: OSA Option Profit Graph and Table



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It should be noted that in using the OSA function to evaluate option positions (or any other Bloomberg function), you can always press the 'Help' key on the Bloomberg keypad to obtain more information, instructions, and other uses of the function. Also, it should be noted that once you have loaded an option or any security, you can apply the other functions by simply typing in the name of the function. For example, to obtain a description of the option, you can type DES at the top left side of the screen. Alternatively, to access other functions, you can hit the menu key to return to the menu function screen.

OV - Option Valuation Screen

The OV Function Screen displays price and volatility data on a selected option and calculates an OPM value for a loaded option. The OV Screen for the February 95 IBM call is obtained by moving the cursor to line 3 on the OMON IBM Screen and clicking OV. Exhibit E.2-5 shows the option's OV screen accessed on January 6, 2007.

Exhibit E.2-5: OV Screen

<HELP> for explanation. P141 Equity OV
 Screen saved as U:\Derivative Book Chapters\Bloomberg Text\Bloomberg tables\OV s

Standard Option Valuation Page 1/2

IBM US INTL BUSINESS MACHINES CO Currency: USD

Price of IBM US Equity **97.42**

Strike: **95.00** **97.516** (USD) Rate: **5.047** % Semiannual

Exercise Type: American
 Put or Call: Call

Time to Expiration: **42** **02:49** Model Type: Default (Roll-Geske)

Trade: **1/ 6/07** **13:26**
 Expiration: **2/17/07** **16:05**
 Settle Date: **1/ 6/07**
 Exercise Delay: **0**

1-Default
 2-Black-Scholes
 3-Trinomial
 4-Roll-Geske
 5-Square Root C.E.V.
 6-Enhanced Discrete Dividends

Option Valuation and Risk Param			
Value	Percent	Time Value:	
Price: 97.42	4.311 %	Theta: 0.03616	Num of Divs 1
Volatility: 19.591 %		Premium: 1.82714	Sum of Divs 0.153
Delta: 0.68370		Parity: 2.42000	Last Div Date 2/ 8/07
Gamma: 0.05525		Gearing: 23.19524	
Vega: 0.11807		Rho: 6.53108	

Australia 61 2 3927 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 319 2000 Copyright 2007 Bloomberg L.P.
 H250-668-0 06-Jan-2007 13:32:12

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The OV Screen in the exhibit shows the OPM value (“Price”), volatility, and Greeks (bottom left). In the case of the February 95 call option on IBM, the OPM value is 4.2 and the volatility is 19.591%. The OPM value is based on the Roll-Geske option pricing model with defaulted future dividend payments and projected ex-dividend dates (lower right box) incorporated into the valuation.

On this screen, you can determine options values and other features (such as the Greeks), given different selected inputs. The following are some of the key features and functions available on the OV Screen:

- **Choice of Option Model:**
 - **Black-Scholes Model:** For European options on stocks with continuously compounded dividends.
 - **Trinomial Model:** for European and American options; uses continuous dividend yield and discrete dividend payments. Bloomberg’s Trinomial model is good estimate of the binomial model; Bloomberg’s Trinomial provides a good estimate of Known Dividend-Payment Binomial Model.
 - **Roll-Geske Model:** For American and European options with discrete dividends; Roll-Geske is a good estimate of the Known Dividend-Payment Binomial Model.
 - **Square Root Constant Elasticity of Variance (CEV) Model:** For European options.
 - **Enhanced Discrete Dividends:** A trinomial model for discrete dividends.

To select option model, you click the box to the right of “Model Type.”

- **Choice of Dividend:** On the OV Screen there is a menu of dividend information and defaults from which you can choose or change. To view the dividend information and defaults, you type 3 and then hit <go>. This will bring up a dividend information and menu screen. On this screen, you can select (depending on the model) either dividend yield (B-S or Trinomial) or discrete dividends (Trinomial).
- **Choice of Volatility:** On the OV Screen, the user has the choice select the volatility and interest rate. The volatility on the OV Screen is the annualized standard deviation of the daily logarithmic price return expressed as a percentage. The default volatility is the historical volatility of stock’s logarithmic return. On Bloomberg Screens, you can change any value shown with an amber background.
- **Choice of Graphs:** On page 2 of the OV Screen are customizable graphs showing the option’s price plotted against the underlying price of the stock at different evaluation dates, and information on the underlying stock’s volatility (e.g., volatility smiles). Different graphs and price relations can be generated by accessing the options appearing on page 2.

Example: Black-Scholes Model Using the OV Screen: To determine the B-S OPM value on the IBM call on the OV Screen (Exhibit E.2-5):

- Click “2” on the pull-down menu for “Model Type” and then hit <go>.

- Type the number 3 to access the dividend menu (top left corner of the screen). You have the choice to select a different dividend model projection on IBM or enter your own estimate. In this example, suppose you inputted an annual dividend yield of 2% in the amber dividend yield box.
- Press <Menu> to return to the OV Screen.
- On the OV screen, you can change the volatility or risk-free rate (amber boxes). In this example, suppose you had changed the volatility to 22%.

Exhibit E.2-6 shows the resulting Bloomberg screen for the B-S OPM value on the February 95 IBM call with a volatility of 22% and dividend yield of 2%. As shown, the B-S price is 4.43. The screen also shows the Greek values, and on page 2, the screen (not shown here) shows B-S OPM values for different evaluation dates.

Exhibit E.2-6: OV Screen Using B-S OPM

<HELP> for explanation. P141 Equity **OV**

Standard Option Valuation				Page 1/2
IBM US INTL BUSINESS MACHINES CO				Currency: USD
Price of IBM US Equity 97.42			Hit 1 GO for save/send screen Hit 2 GO for notes Hit 3 GO for dividends Hit MENU for exotic option types Hit PAGE for scenario graph	
Strike:	95.00	97.516%	(USD)Rate:	5.047% Semiannual
Exercise Type:	A American			
Put or Call:	C Call			
Time to Expiration:	42	02:27	Model Type:	2 Black-Scholes
Trade:	1/ 6/07	13:48		
Expiration:	2/17/07	16:15		
Settle Date:	1/ 6/07			
Exercise Delay:	0			
Option Valuation and Risk Parameters				Dividends Continuous
Value	Percent	Time Value:	2.01235	Dividend Yield 2.00%
Price: 4.432343	4.550%	Theta:	0.03634	
Volatility:	22.000%	Premium:	2.06564	
Delta:	0.66126	Parity:	2.42000	
Gamma:	0.05006	Gearing:	21.97934	
Vega:	0.12095	Rho:	6.92226	

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
Hong Kong 852 2377 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2007 Bloomberg L.P.
H250-668-1 06-Jan-2007 14:12:34

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Example: Binomial (Trinomial) Model Using the OV Screen: To determine the binomial OPM value on the IBM call:

- Click “Trinomial” from the pull-down menu on “Model Type” and then hit <go>.
- Type the number 3 to access the dividend menu. Here you have the choice of using the dividend yield (Choice 1) or discrete dividends (Choice 2). To use the discrete dividend, you select 2 in the “use box”. A projected dividend stream is displayed with the dividend shown for each ex-dividend date for IBM. The relevant ex-dividend dates for the option are shown in amber and can be changed. For the February IBM option (accessed on January 6, 2007), there was only one projected ex-dividend date (2/8/07). The projected dividend on that date was \$0.153. You can change the dividend. For this example, suppose you had changed the dividend to \$0.25.
- Press the menu key to return to the OV screen.

- On the new OV screen, you can change the volatility or risk-free rate (amber boxes). In this example, suppose you had changed the volatility to 22%.

As shown in Exhibit E.2-7, the Trinomial/binomial value of the February 95 IBM call (on January 5, 2007) is 4.456205. The screen also shows the Greek values and the information on the discrete dividends; the screen on the right, in turn, shows the projected dividend stream for IBM that was accessed for a longer-term IBM option.

Exhibit E.2-7: OV Screen Using Binomial/Trinomial OPM

<HELP> for explanation. P141 Equity OV

Standard Option Valuation			
IBM	US	INTL BUSINESS MACHINES CO	Currency: USD
Price of IBM US Equity 87.42			
Strike:	95.00	97.51%	(USD)Rate: 5.047%
Exercise Type:	American		
Put or Call:	Call		
Time to Expiration:	42	02/27	Model Type: Trinomial
Trade:	1/ 6/07	13:48	
Expiration:	2/17/07	16:15	
Settle Date:	1/ 6/07		
Exercise Delay:	0		
Option Valuation and Risk Parameters		Dividends Discrete	
Value:	4.456205	Percent:	4.57%
Volatility:	22.00%	Theta:	0.04211
Delta:	0.66641	Premium:	2.09013
Gamma:	0.05048	Parity:	2.42000
Vega:	0.12054	Gearing:	21.86165
		Rho:	6.33056
		Time Value:	2.03621
		Num of Divs:	1
		Sum of Divs:	0.250
		Last Div Date:	2/ 8/07

<HELP> for explanation. N108 Equity OV

Standard Option Valuation			
VIB	US	INTL BUSINESS MACHINES CO	Currency: USD
Price of VIB US Equity 117.0705			
Strike:	117.0705	117.0705	(USD)Rate: 5.047%
Exercise Type:	American		
Put or Call:	Call		
Time to Expiration:	42	02/27	Model Type: Trinomial
Trade:	1/ 6/07	13:48	
Expiration:	2/17/07	16:15	
Settle Date:	1/ 6/07		
Exercise Delay:	0		
Option Valuation and Risk Parameters		Dividends Discrete	
Value:	117.0705	Percent:	117.0705%
Volatility:	22.00%	Theta:	0.04211
Delta:	0.66641	Premium:	2.09013
Gamma:	0.05048	Parity:	2.42000
Vega:	0.12054	Gearing:	21.86165
		Rho:	6.33056
		Time Value:	2.03621
		Num of Divs:	1
		Sum of Divs:	0.250
		Last Div Date:	2/ 8/07

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Other OV Functions

On the graph page (page 2 of the OV Screen), you can change the Y-axis to view different "Greek" values for either different underlying security prices or for different volatility changes. Exhibit E.2-8 shows a call price graph (IBM B-S call values for different IBM stock prices), a gamma graph (gamma values for different stock prices), and price and volatility graph (B-S call values for different volatilities). The Bloomberg values are obtained using the B-S program with the Bloomberg default values for volatility and dividend yield.

Exhibit E.2-8: OV Screen Graphs

B-S OPM Call Price, Gamma, and Price and Volatility Graphs

<HELP> for explanation. P141 Equity OV

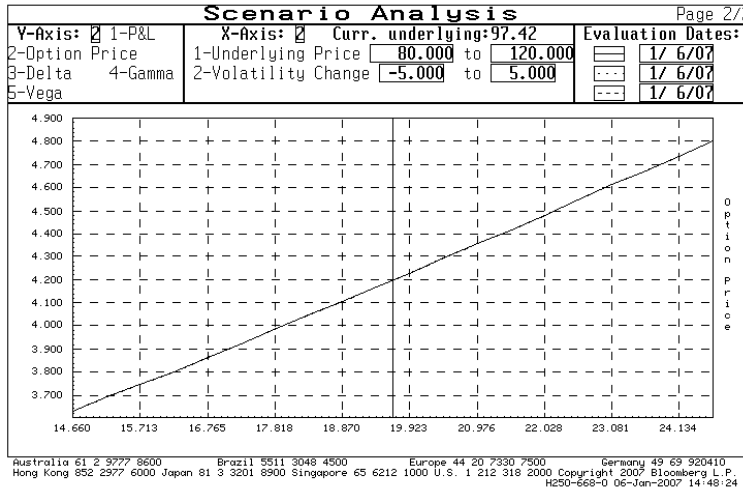
Scenario Analysis			
V-Axis:	X-Axis:	1-Underlying Price	2-Volatility Change
1-P&L	1-Underlying Price	80.000 to 120.000	---
2-Option Price	2-Volatility Change	---	-5.000 to 5.000
3-Delta	4-Gamma	---	---
5-Vega		---	---

<HELP> for explanation. P141 Equity OV

Scenario Analysis			
V-Axis:	X-Axis:	1-Underlying Price	2-Volatility Change
1-P&L	1-Underlying Price	80.000 to 120.000	---
2-Option Price	2-Volatility Change	---	-5.000 to 5.000
3-Delta	4-Gamma	---	---
5-Vega		---	---

<HELP> for explanation.

P141 Equity OV



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Other Equity Option Functions

In addition to the OSA and OV functions, a number of other derivative functions can be accessed either from the “Options, Warrants, and Convertible Screen” or if the stock or option is already loaded by typing in the function’s name, and if it is not loaded, by entering: “Company Ticker [EQUITY] “Function Identifier” (e.g., IBM [EQUITY] OSA)). The lists below provide descriptions and the related screens for IBM options on January 11, 2007 on some of the popular Bloomberg stock option functions. It is worth noting again, that once you have accessed the function, you can always press the green “Help” key to obtain information on the function. Also note that many of the function screens allow you to access the defaulted values for viewing and changing.

- OMST: Most Active Options function** brings up the most active options on the selected stock. Enter [EQUITY] OMST:

Exhibit E.2-9: OMST Screen

<HELP> for explanation, <MENU> for similar functions. N108 Equity OMST

Enter #<Equity><GD> for selection. Note: All values in USD

Pages: Page 1 of 3

1 - Most Active INTL BUSINESS MACHINES CORP Total Call Put

2 - Most Up T-today or P-previous Volume 27,702 17,869 9,833

3 - Most Down W-volume O-open inter. Open Int. 761,855 410,617 351,238

Underlying: Last Volume 1-Day Chg Open High Low Yest. 2-Day Chg

IBM	US	99.34	6636600	+69	98.99	99.69	98.50	98.69	+44
Option	Symbol	Last	Chng	Vol	Option	Symbol	Last	Chng	Vol
1Jan07 100 Calls	AT	1.35	+27	5859	17Feb07 110 Calls	BB	.20	+.05	447
2Jan07 90 Puts	MR	.01	-.04	2277	18Jan07 110 Calls	AB	.05	unch	418
3Feb07 105 Calls	BA	.65	+.05	2133	19Apr07 120 Calls	DD	.15	+.05	400
4Feb07 100 Calls	BT	2.15	+.22	2053	20Apr07 95 Calls	DS	6.94	+.48	283
5Jan07 100 Puts	MT	1.95	-.47	1727	21Jan08 80 Puts	MP	1.15	-.05	280
6Jan08 95 Puts	MS	4.00	-.30	1528	22Jul07 120 Calls	GD	.40	-.05	210
7Apr07 105 Calls	DA	1.95	+.30	1294	23Apr07 115 Calls	DC	.35	unch	203
8Feb07 95 Puts	NS	.81	-.22	1091	24Jul07 110 Calls	GB	1.84	+.04	183
9Feb07 100 Puts	NT	2.71	-.36	956	25Feb07 95 Calls	BS	5.50	+.70	181
10Jan07 105 Calls	AA	.20	+.03	926	26Apr07 95 Puts	PS	1.75	-.15	140
11Feb07 90 Puts	NR	.20	-.05	753	27Apr07 110 Calls	DB	.80	+.05	125
12Jan07 90 Calls	AR	9.37	+.72	620	28Jan07 85 Calls	AQ	14.50	+.87	115
13Jan08 105 Calls	AA	6.10	unch	598	29Jul07 115 Calls	GC	.95	+.05	114
14Jan07 95 Calls	AS	4.60	+.47	564	30Jul07 95 Puts	SS	2.65	-.10	97
15Jan07 95 Puts	MS	.25	-.20	492	31Feb07 105 Puts	NA	6.10	-.50	73
16Apr07 100 Calls	DT	3.90	+.30	460	32Jul07 100 Calls	GT	5.60	+.29	68

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- OHT: Option Horizon Analysis function allows the user to estimate the future prices of options for different period, security prices and volatilities. Enter IBM [EQUITY] OHT:

Exhibit E.2-10: OHT Screen

Menu N108 Equity OHT

THEORETICAL ANALYSIS Hit 99 <GO> to change option model defaults

January 07 Options on IBM US

Expire: 1/20/07 Hit <PAGE> for more months Page 2/10

TODAY				7 DAYS LATER			
Fri 1/12/07	8 Days	5.03%	Rate	Fri 1/19/07	1 Days	5.03%	Rate
Curr. underlying: 99.34				Underlying: 99.34 Display: 0			
CALLS		PUTS		CALLS		PUTS	
STRIKE	Price	DEL I.VOL	Price	DEL I.VOL	Price	Chng %Chng	Price
55	44.30		.05	006	166.6		
60	39.40		.05	007	144.0		
65	34.40		.05	008	123.1		
70	29.33		.05	009	103.8		
75	24.20		.05	011	85.37		
80	19.31		.05	014	67.99		
85	14.40		.05	018	51.15		
90	9.37		.01	008	27.78		
95	4.60	907	23.58	.25	125	27.06	4.35 - .25 -5.34%
100	1.35	454	27.19	1.95	548	27.93	.33 -1.02 -75.9% .99 -.96 -49.4%
105	.20	102	28.26	5.80	902	28.94	-.20 -100% 5.66 -.14 -2.41%
110	.05	026	34.45	10.70	966	38.93	-.05 -100% 10.66 -.04 -.37%
115	.05	020	46.75	15.80	947	60.46	-.05 -100% 15.66 -.14 -.89%
120	.05	017	58.07	20.70	978	64.51	-.05 -100% 20.66 -.04 -.19%
130	.05	013	78.52	30.80	964	98.23	-.05 -100% 30.66 -.14 -.45%

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- OPSA: Option Portfolio Scenario Analysis provides a tool for option analysis. This function screen provides the same screen and functions as OSA. To access, enter IBM [EQUITY] OPSA.
- COAT/POAT: Call Option Analysis Table provides option value sensitivity analysis for up to 8 calls on an underlying security. POAT is identical to COAT except that it does the analysis on puts. Enter IBM [EQUITY] COAT or IBM [EQUITY] POAT:

E.2-11: COAT Screen

<HELP> for explanation. N108 Equity COAT

CALL OPTION ANALYSIS Hit 99 <go> to change option model defaults

January 07 Calls on IBM US

UNDERLYING PRICE 99.34 + .69 Time BID ASK VOLUME PREV
IBM US 1/12 .00 .00 6,636,600 98.65

7 days left at 5.03% Finance Rate from 1/13/07 to 1/20/07 Expiration

Strikes	Market		User		Hedge DEL	TIME GAM	6-Day VALUE	I.VOL DECRY	CHANGE VEGA	OPTN UNDER	PREV
	PRICE	I.VOL	Price	Volat							
1) 65	34.40										
2) 70	29.33										
3) 75	24.20										
4) 80	19.31										
5) 85	14.40										
6) 90	9.37										
7) 95	4.60	25.70%	4.60	25.70%	902	0486	.26	.25	.025	+2.43%	-6.46%
8) 100	1.35	29.16%	1.35	29.16%	453	0981	1.35	.99	.05	+1.14%	-1.04%
9) 105	.20	30.26%	.20	30.26%	102	0425	.20	.20	.025	+2.38%	-.52%
10) 110	.05	36.85%	.05	36.85%	026	0119	.05	.05	.009	+5.68%	-.39%
11) 115	.05	50.00%	.05	50.00%	020	0070	.05	.05	.007	+7.02%	-.37%
12) 120	.05	62.09%	.05	62.09%	017	0048	.05	.05	.006	+8.19%	-.36%
13) 130	.05	83.94%	.05	83.94%	013	0028	.05	.05	.005	+10.2%	-.35%

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5. **OVX – Exotic Option Valuation.** This screen displays the different exotic option types in which Bloomberg has functions for valuation. Each function works similar to the OV screen. To get to the OVX screen, you must first load the underlying equity. Once the security is loaded, OVX defaults to the OV screen. The following exhibits show the OVX Screen and the Chooser Option Valuation Screen for IBM. Enter IBM [EQUITY] OVX:

Exhibit E.2-12: OVX Screen

<HELP> for explanation.

N108 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)CHOOSE 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)CROSS-CURRENCY ASIAN
	20)TWO COLOR RAINBOW OPTIONS (OVXT)

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<HELP> for explanation.

N108 Equity **OVX**

Chooser Option Valuation		Page 1 of 2
IBM	US	INTL BUSINESS MACHINES CO Currency: USD
Price of IBM US Equity	99.34	Hit 1 GO for save/send screen Hit 2 GO for notes Hit 3 GO for dividends Hit MENU for exotic option types Hit PAGE for scenario graph
Call Strike:	99.34	(USD)Rate: 5.090% Semiannual
Put Strike:	99.34	
Trade Date:	1/13/07	Choice Date: 2/27/07
Settlement Date:	1/13/07	Exercise Type of chosen option: <input type="checkbox"/> European
Days to Exp. of Call:	90	Days to Exp. of Put: 90
Expir. Date of Call:	4/13/07	Expir. Date of Put: 4/13/07
Settle Date of Call:	2/27/07	Settle Date of Put: 2/27/07
Exercise Delay of Chosen Option:	0	
Option Valuation and Risk Parameters		Dividends Continuous
Value	Percent	Time Value:
Price: 4.762729	4.794%	4.76273
Volatility: 14.035%		7-Day Decay: 0.26897
Delta: 0.23709		Premium: 4.7
Gamma: 0.13278		Parity: 0.00000
Vega: 0.32823		Gearing: 20.85779
		Dividend Yield 0.62%

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6. **CALL** and **PUT** show OPM call and put values, implied volatilities, and Greeks for a number of options on the selected security. It allows you to compare actual and model prices and to change volatility and interest rate assumptions. Enter IBM [EQUITY] CALL or Enter IBM [EQUITY] PUT:

Exhibit E.2-13: CALL Screen

<HELP> for explanation, <MENU> for similar functions. N108 Equity CALL

CALL SUMMARY PAGE Hit 99 <go> for option model defaults

IBM US INTL BUSINESS MACHINES CORP 20:10 Hedge: F Days 7 Fin Rate 5.03 Volat: 13.23

99.34 +.69 Bid .00 Ask .00

	LAST TRADE INFO			IMPL VOLAT		HEDGE			*THEORETICAL Price Diff
	Bid	Ask	Last Chnge	Bid	Ask	Del	Gam	Vega	
IBZ Jan 07									
1) AG 35	64.10	64.40	61.60 unch	b.int 279.9	:1000*				64.39 +.12
2) AH 40	59.10	59.40	57.50 unch	b.int 240.6	:1000*				59.38 +.13
3) AI 45	54.20	54.40	53.00 unch	b.int 205.6	:1000*				54.38 +.08
4) AJ 50	49.20	49.40	48.50 unch	b.int 173.6	:1000*				49.39 +.09

IBM Jan 07 Days 7 Fin Rate 5.03 Volat: 13.23

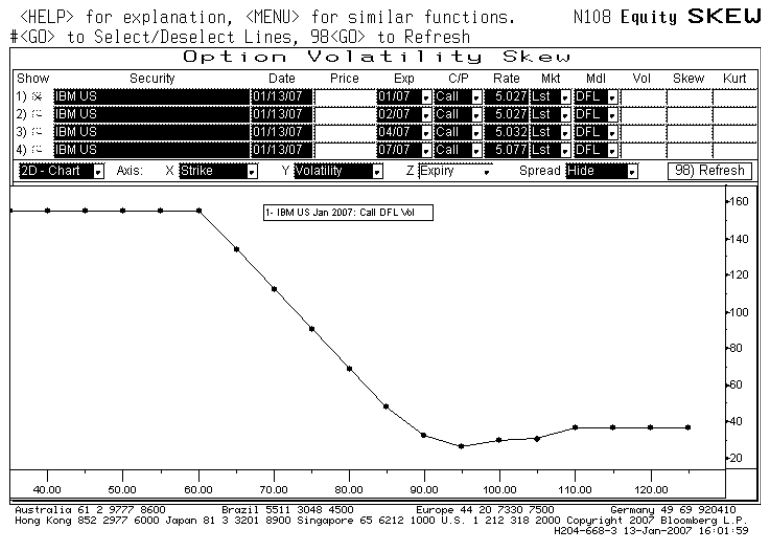
5) AK 55	44.20	44.40	44.30 unch	b.int 143.3	:1000*				44.39 +.09
6) AL 60	39.20	39.40	39.60 +1.40	b.int 109.6	:1000*				39.40 +.10
7) AM 65	34.20	34.40	34.50 unch	b.int b.int	:1000*				34.40 +.10
8) AN 70	29.20	29.40	29.33 +.83	b.int b.int	:1000*				29.41 +.11
9) AO 75	24.20	24.40	23.91 +.11	b.int b.int	:1000*				24.41 +.11
10) AP 80	19.20	19.40	19.31 +.11	b.int b.int	:1000*				19.42 +.12
11) AQ 85	14.20	14.40	14.50 +.87	b.int b.int	:1000*				14.42 +.12
12) AR 90	9.30	9.50	9.37 +.72	b.int 39.51	:1000*				9.43 +.03
13) AS 95	4.50	4.70	4.60 +.47	20.67 29.47	902 049 .02				4.44 -.16
14) AT 100	1.35	1.40	1.35 +.27	29.17 30.09	454 097 .05				.49 -.89
15) AA 105	.20	.25	.20 +.03	30.27 32.20	110 043 .03				.00 -.22
16) AB 110		.05	.05 unch	b.int 36.87					.00

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7. **SKEW** displays implied volatilities for different exercise prices, providing a volatility smile. Enter IBM [EQUITY] SKEW:

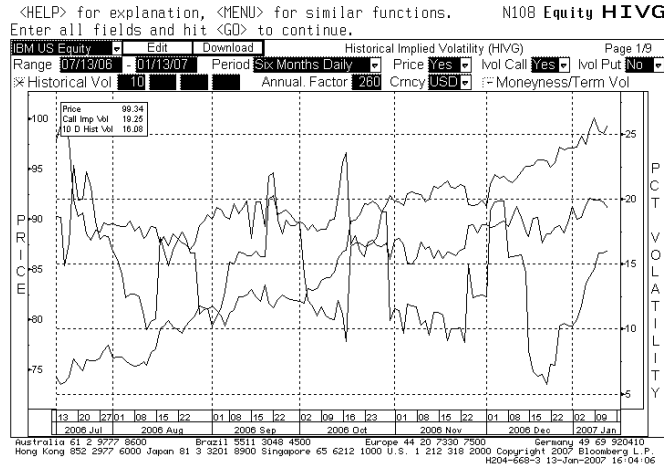
Exhibit E.2-14: SKEW Screen



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8. HIVG displays historical implied volatilities. Enter IBM [EQUITY] HIVG:

Exhibit E.2-15: HIVG Screen



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Stock Warrants

Information on warrants issued by companies can be accessed by:

- Entering “Company Ticker” [EQUITY]
- Clicking “Options, Warrants & Convertible”
- Clicking either Warrant Valuation (WRNT) or Warrant Custom Monitor (WCM).

The WCM screen provides information on the outstanding warrants on the stock. Clicking one of the contracts will bring up a menu table; on that screen type DES to obtain a description of the warrant. Exhibit E.2-16 shows the Description Screen for an IBM warrant with a 115 strike and expiring on 12/19/08.

Exhibit E.2-16: Warrant Description Screen

ABN13701 GR € C .62 G +.11 F --x-- Equity DES
 As of Jan10 DELAYED Op .63 F Hi .63 F Lo .62 F
 DESCRIPTION Page 1/2
 ABN13701GR ABN NV-CW08 INTL BUSINESS ID CN All News/Research
 ISIN NL0000711778

WARRANT			UNDERLYING		
PRICE	EUR	.62	TYPE	EQUITY	31 DES IBM US
HIGH	01/10	EUR .63	COVERED AMERICAN CALL	PRICE	USD 98.89
LOW	10/03	EUR .16	STRIKE/SH USD	115.0000	HIGH 01/09 USD 100.33
YTD CHANGE	EUR	.2	SHARES/WARRANT	.10000	LOW 07/18 USD 72.73
% CHANGE		37.78	EXPIRATION	12/19/08	12 EPS USD 5.950
1) WRNG %PREMIUM		24.412	1ST EXERCISE	9/26/06	P/E 16.62
GEARING		12.314	ISSUE @	.267	9/26/06
PARITY	EUR	-1.244	ISSUE AMT	100K	SHARES OUT 1506.35M
CFP		12.896			MARKET VALUE 148963.14M
UNDER/STRIKE		.860	ISSUER	ABN Amro Bank NV	IND GROSS YLD 1.21%
2) OVX IMP VOL.		20.865	MIN. EXERCISE	1	HIST. VOLATIL. 13.969
DELTA		.03378	SETTLE	EUR	EX-DATE TYPE AMT
NORMALIZED DELTA		.43751			11/ 8/06 REG CASH \$.3
GAMMA		.00104	FX USD/EUR	1.2953	

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Typing OV, bring up the ‘Warrant Option Valuation Screen’ on the selected warrant. Like the option valuation screen, you can use this screen to select the option pricing model, dividends, and volatility (or accept the defaulted values) to determine the price of the warrant. Exhibit E.2-17 shows the OV Screen for the 115 IBM warrant using the Trinomial model. As shown, the model’s warrant value (on January 10, 2007) was \$0.62 when IBM stock was trading at 98.09.

Exhibit E.2-17: Warrant OV Screen

<HELP> for explanation.

N236 Equity OV

Warrant Option Valuation				Page 1 of 2	
ABN13701GR		ABN NV-CWO8 INTL BUSINESS		Currency: USD	
Price of IBM US Equity	98.89	Hit 1 GO for save/send screen Hit 2 GO for notes Hit 3 GO for dividends Hit MENU for exotic option types Hit PAGE for scenario graph			
Strike:	115	116.291%			
Exercise Type:	<input checked="" type="checkbox"/> American	(USD)Rate:	4.822%	<input type="checkbox"/> Semiannual	
Put or Call:	<input type="checkbox"/> Call				
Shares/Warrant:	0.1000	Dilutive?:	<input checked="" type="checkbox"/> Not Dilutive		
Shares Outstanding:		Warrants Outstanding:			
Capped?:	<input checked="" type="checkbox"/> Call Cap:	0.00			
Days to Expiration:	709	Model Type:	2 Default (Trinomial)		
Trade Date:	1/10/07	Option Curr:	EUR	1-Fixed/2-Float: <input checked="" type="checkbox"/>	
First Exercise:	mm/dd/yy	Reinv. Rate:	3.87%	USD/EUR:	1.296
Expiration Date:	12/19/08	Correlation:		Volatility:	6.290%
Settlement Date:	1/10/07	Warrant Price Type:	<input type="checkbox"/> Absolute		
Exercise Delay:	0	Face Amount:	100		
Option Valuation and Risk Parameters				Dividends Continuous	
Value	Percent	Time Value:	0.620	Dividend Yield	1.15%
Price:	.62	Theta:	0.00085		
Volatility:	20.868%	Premium:	24.4		
Delta:	0.03377	Parity:	-1.24354		
Gamma:	0.00103	Gearing:	12.31185		
Vega:	0.04127	Norm. Delta:	0.43754		
<small>Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2007 Bloomberg L.P. H204-668-2 10-Jan-2007 20:31:32</small>					

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General Stock Option Market Information – ODT

In addition to accessing information and analytics on a given stock option, Bloomberg also provides information on the option market. To access such information, you type ODT. Bloomberg’s ODT function brings up a menu and sub-menu of descriptive and analytical functions for markets: equity ([EQUITY]), indices ([INDEX]), commodities ([CMDTY]), currency ([CRNCY]), corporate bonds ([CORP]), and government securities ([GOVT]).

To access the menu for equity options, you press the [EQUITY] key and then types ODT. On the resulting menu, you can click “Derivatives” to get a list of functions related to general market information on equity derivatives. For example, hitting MOSO brings up a screen (Exhibit E.2-18) showing the most active stock options trading at that time.

Exhibit E.2-18: MOST Screen

<HELP> for explanation, <MENU> for similar functions. N108 Equity MOSO
 Enter #<Equity><go> or #<Corp><go> for selection.

Most Actives by Volume Page 1/3

PAGES
 1-Most Active US Exchange:US Opt Comp 0 1-Today,2-Previous * Ex-Date
 2-Most Up 1 1-Name,2-Ticker 1 1-Net,2-Percent * Split
 3-Most Down 1 1-Name,2-Ticker 1 1-Equity,2-Index * Ex & Split

Options (Only US Index options avail)

Name	Last	Chng	vol	Name	Last	Chng	vol
1)INTC Jan07 C22 1/2	NO+HK	.40+	13	59193 15IWM Jan07 C80	IOH+AB	.20+	10 23385
2)AAPL Jan07 C95	IOH+AS	2.35-	.85	47198 16CMCSK Jun107 C42	COK+GT	3.40+	.20 23244
3)MSFT Jan07 C32	IOH+AR	.05	unch	44321 17AMD Jan07 P17 1/2	IOH+HI	.20+	.15 22980
4)MSFT Jan07 C30	IOH+AK	1.20+	.36	42650 18ART Jan07 C40	IOH+HI	.95+	.12 20264
5)SPY Jan07 P143	IOH+HI	.50-	.60	40106 19F Jan08 P7 1/2	IOH+HI	.95-	.05 20136
6)IWM Jan07 C79	IOH+AR	.60+	.25	39820 20VLO Jan07 P57 1/2	IOH+HI	6.90-	2.10 20011
7)ELN Jan08 C30	IOH+AF	.55-	.05	38420 21CVC Jun07 P25	IOH+RE	.40+	.10 20000
8)RIO Jan07 C30	IOH+AF	.40+	.15	35291 22CMCSK Jan07 C40	IOH+HI	3.20+	.80 19566
9)IWM Jan07 P77	IOH+HI	.14-	.16	29516 23XLE Mar07 C56	IOH+CD	2.30+	.70 19085
10)AAPL Jan07 C100	IOH+AT	.75-	.45	28585 24IWM Jan09 P78	IOH+NA	7.10-	.83 19010
11)IWM Feb07 P78	IOH+AT	1.10-	.30	27141 25AAPL Jan07 P90	IOH+HR	.85+	.05 18733
12)SYMC Jan07 P20	IOH+HD	.25+	.20	24525 26AAPL Jan07 P85	IOH+HR	.35+	.05 18578
13)ORCL Jun07 C19	IOH+FT	.75	unch	22942 27HAL Jan07 C30	IOH+AF	.15+	.05 17073
14)LLY Feb07 C55	IOH+BK	.30+	.05	23562 28IWM Mar07 P78	IOH+OZ	2.10-	.50 17029

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E.3 SPOT INDEX AND CURRENCY OPTIONS

Index Options

To access a spot index:

- Enter [INDEX]
- On the menu screen that appears, click the desired index: Commodity, Corporate Bond Indices, Currency, or Equity (indices are in the ‘Market’ category).
- To access an equity index, click “Equity.” This will bring up a screen of equity indices.

On the equity index screen, there is an extensive list of indices (many with derivative contracts). Of particular note is the Major Market Indices (15), IMEN. To find a derivative on an index in this category:

- Click Major Market Indices (15), IMEN.
- Page down on this menu to find the index of interest: DJIA (DJII), NASDAQ 100 Stock Index (NDQ), New York Composite Index (NYA), Russell 2000 (RTY), S&P 100 (OEX) and S&P 500 (SPX).
- Click the index of interest; for most indices, this brings up a screen showing the securities making up the index (and their tickers).
- Press <Menu> to bring up a menu of functions on the selected index. This menu is similar to the stock menu screen. From the menu, the user can access information and analytical functions on the selected index.

Alternatively, if you know the index ticker you can access the function menu directly by entering the index's ticker and pressing [INDEX]. For example, to access the S&P 500, enter: SPX [INDEX].

Example: S&P Spot Options: To access the S&P 500 derivative:

- Enter SPX [INDEX]
- On the SPX Menu, click “Derivative” to bring up SPX’s derivative screen.

SPX’s derivative screen is similar to the Option, Futures, and Convertible Screen for a specified stock. It includes the most active option function (OMST), option monitors (OMON), option scenario analysis (OSA), call and put option analysis (CALL and PUT), and option valuation (OV).

As with stock options, three useful functions are OMON for viewing current options prices, OSA for evaluating option strategies, and OV for valuing call and put options.

1. **OMON:** To find a specific index option, click “OMON”. As with stocks, you need to first specify the “Contract Month”. Given the list of spot index options, you can then move your cursor to the option of interest and left click to select a desired function (see Exhibit E.3-1).

Exhibit E.3-1 OMON for S&P 500 Index Options

SPH7 ↓ 1420.50 s -2.00 Index **OMON**
 At DELAYED Vol 36,194 Op 1423.00 Hi 1425.00 Lo 1414.00 OpInt 605,742y

Template List		Edit		Contract Months		Security List		SPH7 Index		Go	
Option Monitor: S&P 500 FUTURE Mar07											
Center		1420.50		Number of Strikes		9		-or-		% from Center	
										Exchange C (Composite)	
Ticker	Strike	Bid	Ask	Last	Volume	Ticker	Strike	Bid	Ask	Last	Volume
SPH7 JAN 07 (Contract Size: 250)						SPH7 JAN 07 (Contract Size: 250)					
1) SPF7C	1410			16.70	s 30	16) SPF7P	1410	5.20		6.20	s 268
2) SPF7C	1415	13.30	13.80	13.40	s 86	17) SPF7P	1415	7.70		7.90	s 1230
3) SPF7C	1420	9.80	10.30	10.30	s 153	18) SPF7P	1420		10.80	9.80	s 310
4) SPF7C	1425		8.20	7.70	s 239	19) SPF7P	1425	11.80		12.20	s 232
5) SPF7C	1430	5.40	5.80	5.60	s 161	20) SPF7P	1430			15.10	s 60
SPH7 FEB 07 (Contract Size: 250)						SPH7 FEB 07 (Contract Size: 250)					
6) SPG7C	1410			26.40	s	21) SPG7P	1410	15.60	16.40	16.00	s 10
7) SPG7C	1415			23.20	s	22) SPG7P	1415	17.40	18.20	17.70	s 15
8) SPG7C	1420	19.00		20.10	s	23) SPG7P	1420	19.30	20.10	19.60	s 325
9) SPG7C	1425	17.20	18.00	17.20	s 60	24) SPG7P	1425	21.50	22.30	21.70	s
10) SPG7C	1430			14.70	s 55	25) SPG7P	1430	23.90	24.70	24.10	s 30
SPH7 MAR 07 (Contract Size: 250)						SPH7 MAR 07 (Contract Size: 250)					
11) SPH7C	1410		35.00	34.10	s	26) SPH7P	1410	23.60	24.40	23.70	s 1
12) SPH7C	1415	30.90	31.70	31.00	s	27) SPH7P	1415	25.30	26.10	25.50	s
13) SPH7C	1420		28.80	27.90	s	28) SPH7P	1420	27.30	28.10	27.40	s 1
14) SPH7C	1425		25.90	25.00	s 32	29) SPH7P	1425	29.40	30.20	29.50	s 80
15) SPH7C	1430		23.20	22.30	s 20	30) SPH7P	1430	31.60	32.40	31.70	s

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2. **OV:** Exhibits E.3-2 and E.3-3 show the description (DES) and option valuation (OV) screen generated from Bloomberg on January 8, 2007 for the June 07 S&P 500 with a strike price of 1400.

**Exhibit E.3-2
DES for an S&P 500 Index Option**

SXZ+FT 00 Index DES NIOB Index DES

Option Ticker Description		Underlying Security		Strikes
Sample Option				
Ticker	SXZ+FT 1400 <INDEX>	Ticker	SPX <INDEX>	1385
Name	Call on SPX	Name	Call on SPX	1390
Price	66.00	Price	1412.84	1395
Contract Unit	100			1400
Market Value	\$ 6,600.00			1405
First Trade	Thu Jun 23, 2005			1410
Last Trade	Thu Jun 14, 2007			1415
Expiration	Sat Jun 16, 2007			1420
Exercise Type	EUROPEAN			1425

Exchange Data (CBO) Chicago Board Options Exchange		Volatility Analysis	
Chicago OPTION	08:30-15:15	Historical Volatility:	
Chicago INDEX	08:30-15:15	30 Day HVT	7.92
Value of 1 pt	\$ 100	60 Day HVT	7.35
Tick Size	.05	90 Day HVT	7.40
Tick Value	\$ 5		

Related Functions	
1)OPN	Option Bid-Ask Monitor
2)HVC	Implied Vol Graph
3)GIP	Intraday Price Chart
4)GPD	Daily Bar Chart
5)OV	Option Valuation

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**Exhibit E.3-3
OV for an S&P 500 Index Option**

<HELP> for explanation. NIOB Index OV

Standard Option Valuation		S&P 500 INDEX OPT Jun07C		Currency: USD
XSM7C				
Price of SPX Index	1412.84	Hit 1 GO	for save/send screen	
Strike:	1400.00	Hit 2 GO	for notes	
Exercise Type:	E European	Hit 3 GO	to price off fund. divs	
Put or Call:	0 Call	Hit H&A	for exotic option types	
		Hit PAGE	for screen/crunch	
Time to Expiration:	158 228.56	(USD)Rate:	5.10%	Semiannual
Trade:	17 8/07 17:19	Model Type:	2 Default (Black-Scholes)	
Expiration:	6/16/07 16:15			
Settle Date:	17 8/07			
Exercise Delay:	0			

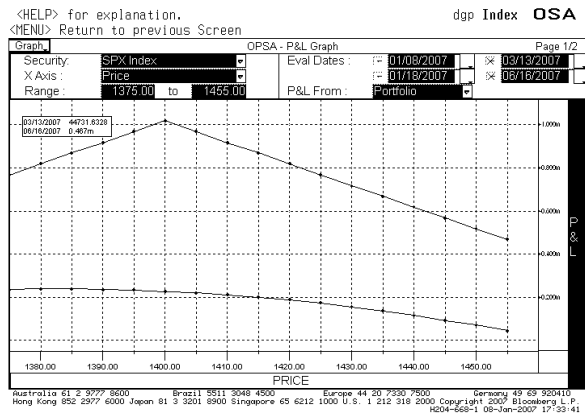
Option Valuation and Risk Parameters		Dividends	
Price:	67.500	Value:	54.66003
Volatility:	13.644%	Percent:	4.778%
Delta:	0.61423	Time Value:	0.21921
Gamma:	0.00297	Theta:	3.86881
Vega:	3.53263	Premium:	12.83997
		Gearing:	20.93096
		Rho:	349.01953
		Dividend flow from	1/08/07
		Annualized	11.00%
		Dividend Flow:	25.421
		Dividend Yield:	1.793%

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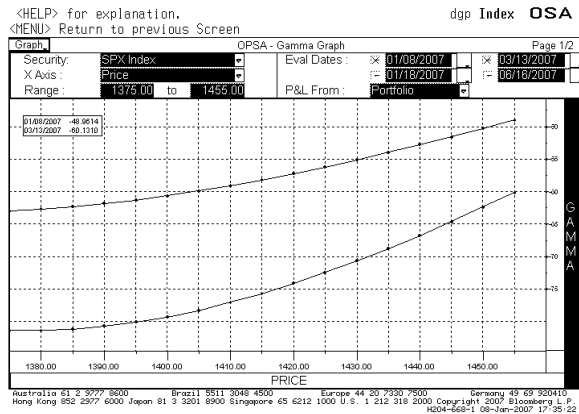
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3. **OSA:** Exhibits E.3-4 and E.3-5 show the profit and loss graph and gamma graph generated using the OSA function to evaluate a short straddle formed with 100 June 1400 S&P 500 calls trading at 34.90 and 100 June 1400 S&P 500 puts trading at 69.50. The graphs were generated from Bloomberg on January 8, 2007.

**Exhibit E.3-4
OSA Profit Graph for S&P Options**



**Exhibit E.3-5
OSA Gamma Graph for S&P Options**



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Spot Currency Options

Spot currency options can be accessed by typing CTM to access Bloomberg's Contract Table Menu and then clicking 'Spot Currency Options' (number 19). This will bring up a screen showing spot currency options traded on different exchanges. To directly access information on spot currency options traded on the Philadelphia Exchange, type FCO <go>. This will bring up a menu screen showing just the PHLX currency options. From either screen, you can then select the desired currency to bring up the OMON Screen showing price and volume information on that currency's option contracts. Exhibit E.3-6 shows the OMON Screen for the options on the spot British Pound on January 10, 2007:

Exhibit E.3-6: OMON for British Pound Options

BPX 193.35s as of close 1/10 Curncy **OMON**
 Vol n.a. OpInt n.a.

Template List	Edit	Contract Months	Security List	BPX Curncy	GO						
Option Monitor: BRITISH £ SPOT AMER STD											
Center	193.35	Number of Strikes	9	-or-	% from Center						
Exchange C (Composite)											
Ticker	Strike	Bid	Ask	Last	Volume	Ticker	Strike	Bid	Ask	Last	Volume
BPX 14 SEP 07 (Contract Size: 31250)						BPX 14 SEP 07 (Contract Size: 31250)					
1) BPU7C	190					16) BPU7P	190	2.53	2.78		
2) BPU7C	192	4.55	4.80			17) BPU7P	192	3.40	3.65		
3) BPU7C	194	3.58	3.83			18) BPU7P	194	4.40	4.65		
4) BPU7C	196	2.81	3.06			19) BPU7P	196				
5) BPU7C	198	2.21	2.36			20) BPU7P	198				
BPX 12 JAN 07 (Contract Size: 31250)						BPX 12 JAN 07 (Contract Size: 31250)					
6) BPG7C	191					21) BPG7P	191	.58	.73		
7) BPG7C	192	2.28	2.43			22) BPG7P	192	.90	1.05	1.05	y
8) BPG7C	193	1.70	1.85			23) BPG7P	193	1.33	1.48	.91	y
9) BPG7C	194	1.20	1.35			24) BPG7P	194	1.85	2.00	1.43	y
10) BPG7C	195	.89	1.04			25) BPG7P	195	2.45	2.60	2.54	y
BPX 9 MAR 07 (Contract Size: 31250)						BPX 9 MAR 07 (Contract Size: 31250)					
11) BPH7C	191					26) BPH7P	191	1.00	1.15		
12) BPH7C	192	2.69	2.94	5.20	y	27) BPH7P	192	1.37	1.52	1.75	y
13) BPH7C	193	2.18	2.33			28) BPH7P	193	1.81	1.96		

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As with index and stock options, you can move your cursor to the desired option and then click to select a function. Alternatively, you can type the Bloomberg function. Exhibit E.3-7 shows the description page for the March 192 BP call on January 10, 2007.

Exhibit E.3-7: DES for a British Pound Option

BPH7C X 192.00 Curncy **DES** N108 Curncy **DES**

Option Ticker	Description	Page 2/2
Sample Option	Underlying Security	Strikes
Ticker BPH7C X 192.00 <CRNCY>	Ticker BPX <CRNCY>	186.00
Name Call on BPX	Name Call on BPX	187.00
Price 5.20	Price 193.35	188.00
Contract Unit BPX		189.00
Market Value \$ 1,625.00		190.00
First Trade Tue Jan 17, 2006		191.00
Last Trade Fri Mar 9, 2007		192.00
Expiration Fri Mar 9, 2007		193.00
Exercise Type AMERICAN	Serial Options Available	194.00
		195.00
		196.00
		197.00
		198.00
		199.00
		200.00

Exchange Data (PHL) Philadelphia Stock Exchange	Volatility Analysis
PhiladelphiaOPTION 02:30-14:30	Historical Volatility:
PhiladelphiaCURRENCY02:30-14:30	30 Day HVT 7.44
Option	60 Day HVT 6.85
Value of 1 pt \$ 312.5	90 Day HVT 6.89
Tick Size .01	
Tick Value \$ 3.125	

Related Functions
1) OMON Option Bid/Ask Monitor 2) HVTG Implied Vol Graph 3) GIP Intraday Price Chart
4) GPO Daily Bar Chart 5) OV Option Valuation

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It should be noted that accessing the OV function to value a spot currency option brings up a screen called the “Multileg Option Valuation” Screen. This function screen is similar to the standard OV screen used for stock and stock indices.

In addition to information and analytical functions on specific currency options, Bloomberg also has a number of functions that provide market information and analytics on the overall currency market that can be used for currency option derivatives. To access general currency market functions and information:

- Pressing [CRNCY]
- Type ODT

On the ODT menu, two functions of note are the “Currency Volatility Surface” (currency volatility smiles) and the “Volatility Comparison.” Also note that currency options can be accessed from the ODT screen by clicking “Futures and Options”; doing this will bring up a menu listing the currency option markets (FCO and CMT).

E.4 FUTURES AND FUTURES OPTION CONTRACTS

Futures Contracts

Many futures and futures option contracts can be found by accessing the “Contract Table Menu” (see Exhibit E.4-1). This menu lists exchange-traded futures contracts, divided into five categories: Agriculture and Livestock, Energy and Environment, Financial Contracts, Index Contracts, and Metals and Industries. To access: Type CTM and press <go>.

Exhibit E.4-1: CTM

<HELP> for explanation, <MENU> for similar functions. N108c Curncy CTM
Enter # <Go> for a list of contracts.

CONTRACT TABLE MENU

Page 1/1

Agriculture and Livestock	19) CURD Spot Currency Options
1) FOOD Foodstuff	20) SYNS Synthetic Interest Rate Strip
2) OGRN Other Grain	21) XCUR Cross Currency
3) FIBR Fibers	22) SWAP Swap
4) LSTK Livestock	23) WCUR Weekly Currency Options
5) CORN Corn	Index Contracts
6) SOY Soy	24) EQIX Equity Index
7) WHET Wheat	25) EIXD Equity Index Spot Options
Energy and Environment	26) NEIX Non-Equity Index
8) COAL Coal	Metals and Industrials
9) CRDO Crude Oil	27) BMTL Base Metal
10) ETCY Electricity	28) PMTL Precious Metal
11) EMIS Emissions	29) IMAT Industrial Material
12) NATG Natural Gas	
13) REFP Refined Products	
14) SHIP Shipping	
15) WTHR Weather	
Financial Contracts	
16) BOND Bond	
17) INTR Interest Rate	
18) CURR Currency	

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From the Contract Table Menu, you can click on the desired category to open the display of contract sources. For example, to access equity index contracts, you type 24 (see Exhibit E.4-1) at the top left corner of the screen or move the cursor to 24 and click. This brings up a screen displaying the contracts on that commodity or index, their tickers, descriptions, exchanges, and types. Exhibit E.4-2 shows the CTM for equity indices.

Exhibit E.4-2: CTM for Equity Indices

<HELP> for explanation. N108c Equity CTM
 Enter # <Go> for a list of contracts.

Equity Index Page 1 /11

Security Type: All Display: Bid Price Sort By: Volume
 Screen Out: No Open Interest: Yes No Volume: Yes

Ticker	Description	Exchange	Type	Bid Price	Opt	MULT
1) SCA Index	S&P 500 E-mini EOM	CME	Future	0.00	✓	
2) ESA Index	S&P 500 E-mini	CME	Future	1416.00	✓	
3) VGA Index	DJ Euro STOXX 50	EUX	Future	0.00		
4) NQA Index	NASDAQ 100 E-mini	CME	Future	1796.00	✓	
5) KMA Index	KOSPI200	KFE	Future	0.00		
6) RRA Index	Russell 2000 Mini	CME	Future	778.60	✓	
7) NZA Index	S&P CNX Nifty	NSE	Future	0.00		
8) EVA Index	S&P 500 EOM	CME	Future	0.00	✓	
9) GXA Index	DAX Index	EUX	Future	0.00		
10) DMA Index	DJ Industrial Average Mini	CBT	Future	12449	✓	
11) NOA Index	Nikkei 225 mini	DSE	Future	17080.00		
12) NKA Index	Nikkei 225	DSE	Future	17080.00		
13) CFA Index	CAC 40 10 EUR	MNP	Future	5527.0		
14) Z A Index	FTSE 100	LIF	Future	6222.5		
15) BZA Index	Bovespa	BMF	Future	0.00	✓	✓
16) XBA Index	Bovespa mini	BMF	Future	0.00		
17) HIA Index	Hang Seng	HKG	Future	20271		
18) QCA Index	OMXS30	SSE	Future	1149.00		
19) FTA Index	Taiwan	FTX	Future	0.00		

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On the Equity OTM Screen, there are several features to note:

- The Opt Column has a check mark if options are traded on the futures contract.
- The MULT Column has a check mark if there are multiple electronic trading sessions.
- The “Sort By” box allows users to sort contracts by volume or open interest.

For information on one of the contracts shown on the CTM Screen for the selected commodity group (e.g., equity indices):

- Type the number of the contract of interest (or move the cursor to that number and click). This will bring up a screen that gives you the choice of selecting either the options on the contract (OMON) or the futures and futures option contracts (CT).
- Click the CT option to bring up a screen listing contracts on the selected underlying commodity, currency, or index.

Example: To access the contacts on the S&P 500 futures contract traded on the CME, you click 4 (page 2 of the CTM equity index screen) and then click CT. This brings up the Contract Table Screen for the S&P 500 futures and futures option contracts (Exhibit E.4-3):

Exhibit E.4-3: CT for Futures on S&P 500 Index

<HELP> for explanation. N127 Index **CT**
 Screen does not monitor with cursor in field.
 Session: **PTT** **Contract Table**
S&P 500 INDEX
 Exchange Web Page Pricing Date: **1/5/07**
 Chicago Mercantile Exchange Delayed prices
 Grey date = options trading

	Last	Change	Time	High	Low	Open	Int	TotVol	Previous Close
1)SPX spot	1409.71	-8.63	16:59	1418.34	1405.75	0	0	0	1418.34
2)SPH7 Mar07	1416.40s	-11.10	Close	1424.20	1414.20	604025	31088	1427.50	1427.50
3)SPM7 Jun07	1429.10s	-11.00	Close	1432.50b	1427.50	13094	65	1440.10	1440.10
4)SPU7 Sep07	1442.30s	-10.90	Close			11254	0	1453.20	1453.20
5)SPZ7 Dec07	1453.70s	-10.90	Close			1812	0	1464.60	1464.60
6)SPH8 Mar08	1465.20s	-10.90	Close			315	0	1476.10	1476.10
7)SPM8 Jun08	1476.70s	-10.90	Close			60	0	1487.60	1487.60
8)SPU8 Sep08	1488.20s	-10.90	Close			0	0	1499.10	1499.10
9)SPZ8 Dec08	1499.70s	-10.90	Close			0	0	1510.60	1510.60

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Note: If there is an option traded on the futures contract it is highlighted in grey. If you had clicked OMON instead of CT, you would have brought up the screen listing the S&P 500 futures options.

On the Contract Table Screen (CT), you can obtain information on a particular contract by setting your cursor on the contract of interest and left clicking to bring up a menu of information and analytics. For example, on January 5, 2007 clicking the June 07 S&P 500 futures shown in Exhibit E.4-2 and then hitting “Contract Information” and then “Description” on the resulting menu would have brought up the description information on the June S&P 500 contract shown in Exhibit E.4-4.

Exhibit E.4-4: DES on June S&P 500 Futures Contract

1 N108 Index **DES**
 Type # <GD> For Related Function
Futures Contract Description Page 1/2

Exchange (CME) Chicago Mercantile Exchange		Related Functions	
Name	S&P 500 FUTURE Jun07	1) CT	Contract Table
Ticker	SPM7 <INDEX>	2) FHG	Futures History Graph
Contract Size	250 \$ x index	3) EXS	Expiration Schedule
Value of 1.0 pt	\$ 250	4) OCM	Option Custom Monitor
Tick Size	.1	5) FVD	Fair Value Detail
Tick Value	\$ 25	Margin Limits	
Current Price	1,429.10 index points	Speculator	Hedger
Contract Value	\$ 357,275 @ 1/05	Initial	17500 14000
Cycle	Mar Jun Sep Dec	Secondary	14000 14000
Trading Hours		To access the night (GLOBEX) session type	
Chicago	Local	GSPA <INDEX> <GD>.	
15:30-08:15	16:30-09:15	To access the special opening quotation of the	
08:30-15:15	09:30-16:15	S&P 500 Index for purposes of final settlement	
		on valuation day type SPXM <INDEX>.	
Cash Settled	Life High 1,450.80	Generics Available	
Valuation Date	Fri Jun 15, 2007	SP1 <INDEX>	
Last Trade	Thu Jun 14, 2007	Through	
First Trade	Fri Jun 17, 2005	SPB <INDEX>	

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In the top right corner of the Description Screen are related functions you can then apply to the futures contracts. Of note is the “Fair Value Detail” function (FVD). This function calculates the fair value of the index futures based on two index futures contracts that are nearest to expiration. The function also includes the carrying cost value (Theo. Value). Exhibit E.4-5 shows the FVD screen for June S&P 500 futures – Equity Index Fair Value. On the FVD screen, users can change the risk-free rate and dividend yield to obtain different carrying cost values and fair values.

Exhibit E.4-5: FVD on June S&P 500 Futures Contract

<HELP> for explanation, <MENU> for similar functions. N108 Index FVD
 ENTER ALL VALUES AND HIT <GO>

EQUITY INDEX FAIR VALUE (DETAIL)

S&P 500 INDEX	Cash	Future	Theo. Future	Fair Value	Spread (Basis)	Upper Bound	Lower Bound
1) SPH7vsSPX	1409.71	1416.40	1418.69	8.98	6.69	10.15	7.80
Risk Free:	5.36%	Expire:	3/16/07	Dividend:	5.58	Dvd Yld:	2.07%
Implied Rate:	4.52%	Days:	69	Percent of Gross Dividend:	100.0%		
2) SPM7vsSPX	1409.71	1429.10	1432.07	22.36	19.39	23.55	21.18
Risk Free:	5.39%	Expire:	6/15/07	Dividend:	11.57	Dvd Yld:	1.89%
Implied Rate:	4.89%	Days:	160	Percent of Gross Dividend:	100.0%		

Note: use RFDL<go> for the risk free rate default.

Percent/Index Points		Transaction Costs	
Buy-Stocks	Sell-Futures (Upper Bound)	Sell-Stocks	Buy-Futures (Lower Bound)
Stock Bid/Ask Spread	=	Stock Bid/Ask Spread	=
Stock Commission	=	Stock Borrowing Cost	=
Future Bid/Ask Spread	=	Stock Commission	=
Commission Futures	=	Future Bid/Ask Spread	=
Other (Stamp, Currcy..)	=	Commission Futures	=
Total Transaction Cost	= 0.08% 1.16	Other (Stamp, Currcy..)	=
		Total Transaction Cost	= 0.08% 1.16

Hit <#> Go to monitor the intra-day spread of cash & futures (Basis)

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To apply other functions or to access other information on the loaded contract, you can go back to the menu of functions (<Menu>) or type the function’s name. The following are some of the useful functions and information that Bloomberg provides for futures contracts:

- **HP** displays a table of historical prices, yields, and values
- **QRM** gives a trade recap
- **TSM** gives a trade matrix
- **GIP** is an intraday price graph
- **GPO** gives a bar chart
- **HVT** displays historical price volatility
- **OV** is the option valuation screen
- **OSA** analyzes a portfolio of options on the futures contract

For example, to obtain a profit graph and table for the June S&P 500 futures traded on the CME, you would type OSA to obtain the screen shown in Exhibit E.4-6.

Exhibit E.4-6: OSA on June S&P 500 Futures Contract

<HELP> for explanation, <MENU> for similar functions. dgp Index **OSA**

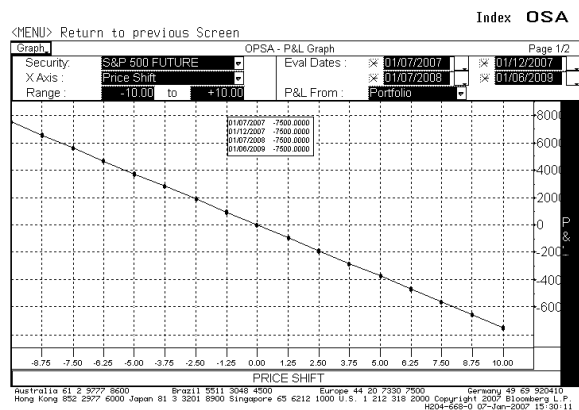
Add Options		Graph	Columns	Save	Delete Mode	OPSA					
Import Source:					Add Security:						
Base Currency:	USD	Total P&L:		0.00	Total Percentage:		0.00				
Security	Price	Position	Cost	P&L	Delta	Theta	Vega				
S&P 500 FUTURE	1429.10	0.00	1429.10	0.00	0.00	0.00	0.00				
L-SPM7 Index											
Scenarios For: S&P 500 FUTURE											
Prc.Shift		Vol.	Date	Rate	P&L	P&L(%)	Points	Delta	Gamma	Theta	Vega
1)	-2.00	0.00	01/14/07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2)	-1.00	0.00	01/14/07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3)	+0.00	0.00	01/14/07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4)	+1.00	0.00	01/14/07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5)	+2.00	0.00	01/14/07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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If you wanted to evaluate a short position in three June S&P 500 futures contract, you would input -3 in the position box and hit return. On the new screen, you can then click the ‘Graph’ key to bring up the position’s profit and loss graph (page 1) and table (page 2) shown in Exhibit E.4-7.

Exhibit E.4-7: OSA Profit Graph and Table



Index **OSA**

<HELP> for explanation, <MENU> Return to previous Screen

01/07/2007		03/07/2007		02/07/2008	
Price Shift	P&L	Price Shift	P&L	Price Shift	P&L
-10.00	7.500K	-10.00	7.500K	-10.00	7.500K
-9.75	6.562K	-9.75	6.562K	-9.75	6.562K
-9.50	5.625K	-9.50	5.625K	-9.50	5.625K
-9.25	4.688K	-9.25	4.688K	-9.25	4.688K
-9.00	3.750K	-9.00	3.750K	-9.00	3.750K
-8.75	2.812K	-8.75	2.812K	-8.75	2.812K
-8.50	1.875K	-8.50	1.875K	-8.50	1.875K
-8.25	937.50	-8.25	937.50	-8.25	937.50
-8.00	0.00	-8.00	0.00	-8.00	0.00
-7.75	-937.50	-7.75	-937.50	-7.75	-937.50
-7.50	-1.875K	-7.50	-1.875K	-7.50	-1.875K
-7.25	-2.812K	-7.25	-2.812K	-7.25	-2.812K
-7.00	-3.750K	-7.00	-3.750K	-7.00	-3.750K
-6.75	-4.688K	-6.75	-4.688K	-6.75	-4.688K
-6.50	-5.625K	-6.50	-5.625K	-6.50	-5.625K
-6.25	-6.562K	-6.25	-6.562K	-6.25	-6.562K
-6.00	-7.500K	-6.00	-7.500K	-6.00	-7.500K

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On the OSA profit screen, you can click the ‘Graph’ key (top left) to obtain other market values and other variables to plot. You also can change the evaluation dates and add futures options to your futures position by clicking “Add Options” on the OSA Index Screen.

Futures Options

In general, to access information and analytical function for a specific futures option, one uses the same steps defined above for futures contract:

- Type CTM to bring up a Contract Table Menu Screen
- Click the desired category to open the display of contract sources

For example, if you wanted to access wheat contracts from the contract table, you would type 7 in the top left corner of the CT Screen or move the cursor to 7 and click. This will bring up the screen displaying the wheat commodity contracts, their tickers, descriptions, exchanges, and types (see Exhibit E.4-8). You can then type the number of the contract of interest or move the cursor to that number and click and then select CT on the resulting screen to obtain a list of contracts. For example, to see the wheat contracts traded on the CBT, you would hit 3 (see Exhibit E.4-9) and then click CT to obtain the CBT's wheat contracts. CBT option contracts on the wheat futures contracts are indicated in gray on the CT screen.

Exhibit E.4-8: CTM

<HELP> for explanation. N108c Index **CTM**
 Enter # <Go> for a list of contracts. **Wheat** Page 1 / 1
 Security Type: 1 All Display: Bid Price Sort By: Volume
 Screen Out: No Open Interest: Yes No Volume: Yes

Ticker	Description	Exchange	Type	Bid Price	Opt	MULT
1) VNA Comdty	Wheat, Strong Gluten	ZCE	Future	1860		
2) T2A Comdty	Wheat	NDX	Future	1020.00		
3) W A Comdty	Wheat	CBT	Future	0.00	✓	✓
4) KWA Comdty	Wheat	KCB	Future	481.00	✓	✓
5) MWA Comdty	Wheat, Red	MGE	Future	487 ¹ / ₂	✓	✓
6) FUA Comdty	Barley	NDX	Future	819.20		
7) FYA Comdty	Barley, Feed	ASX	Future	0.00	✓	
8) CAA Comdty	Wheat, Milling	MRT	Future	144.25	✓	
9) VDA Comdty	Wheat, Hard White	ZCE	Future	1537		
10) EBA Comdty	Wheat	SAF	Future	1781.00	✓	
11) T4A Comdty	Wheat	MCI	Future	0.00		
12) WAA Comdty	Barley, Western	WCE	Future	175.50	✓	
13) MVA Comdty	Wheat, Milling	ASX	Future	0.00	✓	
14) OKA Comdty	Wheat	LIF	Future	97.00	✓	
15) YPA Comdty	Wheat, Mini	CBT	Future	0.00		
16) WJA Comdty	Wheat	UCE	Future	160.00	✓	
17) FUA Comdty	Wheat	ASX	Future	0.00		

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Exhibit E.4-9: CT Screen for Wheat Futures

<HELP> for explanation, <MENU> for similar functions. N127 Comdty **CT**
 <PAGE> now scrolls 17 contracts. Enter # <Go> to scroll contracts.
 Session: **PTT** Contract Table
WHEAT FUTURE (CBT)
 Exchange Web Page Pricing Date: **1/ 5/07**
 Chicago Board of Trade Delayed prices

Grey date = options trading	Last	Change	Time	High	Low	OpenInt	TotVol	Previous
1W H7 Mar07	470 ¹ / ₄ s	+2 ³ / ₄	Close	471	462 ¹ / ₂	239611	20988	467 ¹ / ₂
2W K7 May07	480 s	+3	Close	481	472 ¹ / ₂	38389	4004	477
3W N7 Jul07	477 s	+4	Close	477 ¹ / ₂	470 ¹ / ₂	83411	4570	473
4W U7 Sep07	481 ¹ / ₂ s	+4	Close	482	476	4774	127	477 ¹ / ₂
5W Z7 Dec07	491 s	+3 ¹ / ₂	Close	492	486	64385	1732	487 ¹ / ₂
6W H8 Mar08	496 s	+4	Close	496	492	363	0	492
7W N8 Jul08	476 s	+3	Close	477	471	16177	436	473
8W Z8 Dec08	487 s	unch	Close	488	485	2885	65	487
9W N9 Jul09	457 s	+2	Close	457	452	1542	0	455

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To obtain information and functions to apply on a particular contract, you set your cursor on the contract of interest and left click. This will bring up a menu of information and analytics that you can access or apply to the contract. For example, clicking the March 07 wheat contract (Exhibit E.4-9) and then clicking "Contract Information" on the resulting menu screen brings up screen for accessing information on the futures contract and futures option contract. The "Description" screens displaying information on the March futures contract (Exhibit E.4-10) and the futures option on that contract ((Exhibit E.4-11) are shown below.

Exhibit E.4-10: DES Wheat Futures

1
Type # <GD> For Related Function
N108 Comdty DES

Futures Contract Description		Page 1/2	
Exchange (CBT) Chicago Board of Trade		Related Functions	
Name TICKER	WHEAT FUTURE (CBT) Mar07 W H7 <CMDTY>	1) CT Contract Table	
Contract Size	5,000 Bushels	2) FHG Futures History Graph	
Value of 1.0 pt	\$ 50	3) EXS Expiration Schedule	
Tick Size	4	4) CRB CRB Movers	
Tick Value	\$ 12.5	5) CRR Commodity Ranked Returns	
Current Price	470 1/4 cents/bu.	Margin Limits	
Contract Value	\$ 23,512.5 @ 1/05	Speculator	Hedger
Cycle	Mar May Jul Sep Dec	Initial	1553 1150
		Secondary	1150 1150
Trading Hours		No. 1 Northern Spring Wheat, No. 2 Soft Red, No. 2 Hard Red Winter, and No. 2 Dark Northern Spring at par. Substitutions at differentials established by the exchange.	
Chicago Local	18:30-06:00 19:30-07:00 09:30-13:15 10:30-14:15	Life High	560
First Delivery	Thu Mar 1, 2007	Life Low	354 1/2
Last Delivery	Fri Mar 23, 2007	Today's Daily Limit	Up Through
Last Trade	Wed Mar 14, 2007	Down	W 10 <CMDTY>
First Notice	Wed Feb 28, 2007	Up	
First Trade	Thu Sep 15, 2005	500%	440%
Generics Available			

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Exhibit E.4-11: DES Wheat Futures Options

<HELP> for explanation, <MENU> for similar functions. N108 Comdty OTD

Option Ticker Description		Page 2/2	
Sample Option		Underlying Security	
Ticker	W H7C 470 J <CMDTY>	Ticker	W H7 <CMDTY>
Name	Call on W H7	Name	Call on W H7
Price	16	Price	470 1/4
Contract on	1 W H7 Future	Contract Size	5,000 Bushels
Market Value	\$ 800.00	Contract Value	\$ 23,512.50
First Trade	Mon Feb 27, 2006	First Delivery	Thu Mar 1, 2007
Last Trade	Fri Feb 23, 2007	Last Trade	Wed Mar 14, 2007
Expiration	Fri Feb 23, 2007	Last Delivery	Fri Mar 23, 2007
Exercise Type	AMERICAN	Serial Options Available	
Cycle	Mar May Jul Sep Dec	Dec	+ serial
Exchange Data (CBT) Chicago Board of Trade		Volatility Analysis	
Chicago Option	18:34-06:00 09:30-13:15	Chicago Future	18:30-06:00 09:30-13:15
Value of 1 pt	\$ 50	Option	\$ 50
Tick Size	1/8	Future	1/4
Tick Value	\$ 6.25	Option	\$ 12.5
Historical Volatility		Implied	
30 Day HVT	28.00	Delta	0.51612
60 Day HVT	27.53	Gamma	0.00988
90 Day HVT	31.54		
Related Functions			
1)OMON	Option Bid/Ask Monitor	2)HIVG	Implied Vol Graph
4)GPO	Daily Bar Chart	3)GIP	Intraday Price Chart
	5)OV	Option Valuation	

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Note, on the option description screen, there are related functions that you can access on the loaded futures option contract by clicking or typing the name of function's identifier. These include:

- **OMON** – option quotes on all options on the futures contract
- **GPO** – daily bar chart
- **HIVG** – implied volatility graph
- **OV** – Option valuation
- **GIP** - Intraday price chart

For example, clicking OMON for the option on the March wheat futures brings up the OMON Screen for the options on that contract (see Exhibit E.4-12). The user can then set the cursor on the option of interest and left clicks to obtain a menu of information and analytics to apply to the selected option. For example, to value the March put option on the March wheat contract with an exercise price of 475, you would move the cursor to 18 (Exhibit E.4-12) and left click OV. The option valuation screen displays the OPM values of the call and put option contracts, as well as delta, gamma, vega, and rho values. On the OV Screen, you can then select model type (e.g., Black-Scholes (Black futures Model) or Trinomial (binomial)), risk-free rate, and volatility (Vol). The screen on January 7, 2007 for the March option contract on the March wheat futures is shown in Exhibit E.4-13. The Black-Scholes model is the Black futures option model and volatility is based on the futures contract historical volatility. For a description of the model, defaults, and input features, press the help key.

Exhibit E.4-12: OMON for Wheat Futures Option Contracts

U H7 470 1/4 s as of close 1/5 08 Comdty OMON
Vol 20,988 OpInt 239,611g

Template List	Side	Contract Months	Security List	U H7	Comdty	SD					
Option Monitor: WHEAT FUTURE(CBT) Mar07											
Center	470.25	Number of Strikes	9	or-	% from Center	Exchange C (Composite)					
Ticker	Strike	Bid	Ask	Last	Volume	U H7	Strike	Bid	Ask	Last	Volume
U H7 FEB 07	(Contract Size: 5000)					U H7 FEB 07	(Contract Size: 5000)				
1) U G7C	450					10) U G7P	450			21 1/4 s	
2) U G7C	460					11) U G7P	460			5 1/4 s	
3) U G7C	470	7	8 1/2	9 7/8 s		12) U G7P	470			9 5/8 s	
4) U G7C	480			6 1/4 s		13) U G7P	480			15 7/8 s	
5) U G7C	490			3 3/4 s		14) U G7P	490			23 3/8 s	
U H7 MAR 07	(Contract Size: 5000)					U H7 MAR 07	(Contract Size: 5000)				
6) U H7C	450			20 7/8 s		15) U H7P	450			12 1/8 s	
7) U H7C	470	14 1/2		16 s		16) U H7P	470			17 1/2 s	
8) U H7C	475					17) U H7P	475	15	16	15 3/4 s	
9) U H7C	480	11		12 1/2 s		18) U H7P	480			21 7/8 s	
10) U H7C	490	8 3/4		9 1/4 s		19) U H7P	490			28 3/8 s	

Exhibit E.4-13: OV for Wheat Futures Option Contracts

<HELP> for explanation. N108 Comdty OV
99 <GO> Options

U H7 Standard Option Valuation Page 1/1
WHEAT FUTURE(CBT) Mar07 Currency: USD

Underlying: Future
Price 470 1/4

Option:
Strike 475 101.010%
Risk Free Rate 5.165%

Model Type: Black-Scholes
Exercise Type: b American

Days to Expiration: 47
Trade Date: 1/7/07 16:45
Settle Date: 1/7/07
Expiration Date: 2/23/07 23:59
Exercise Delay: 0

CALL			PUT				
Price:	4.6241	0.983%	4 5/8	Price:	9.3434	1.987%	9 3/8
Vol.:	10,000			Vol.:	10,000		
Delta:	0.394045	Rho:	-0.595396	Delta:	-0.599492	Rho:	-1.203048
Gamma:	0.022696	Time Value:	4.6241	Gamma:	0.022696	Time Value:	4.5934
Vega:	0.648554	7-day decay:	0.4950	Vega:	0.648554	7-day decay:	0.4905
Theta:	-0.068463			Theta:	-0.067811		

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As with spot options, a useful function to apply to futures options and futures positions is the OSA function for creating profit tables and graphs for different positions. For example, after accessing the futures contract of interest (CBT March Contract: CTM <go>, number 7 for wheat, number 3 for the CBT contract, CT, and then 1 for the March contract), you can type OSA (or find the function in the Option Menu Screen). On the OSA screen, you can take positions in the contract and then click "Add Option" to add option positions. Exhibit E.4-14 shows the profit table generated by shorting 100 March 480 wheat futures call options on January 5, 2007.

Exhibit E.4-14: OSA Wheat Futures and Options

<HELP> for explanation. dgp Comdty OSA
<MENU> Return to previous Screen

Graph OPSA - P&L Graph Page 2/2

Security: WHEAT FUTURE(CBT) Eval Dates: 01/07/2007 01/12/2007
X Axis: Price Shift P&L From: Portfolio
Range: -10 to +10

01/07/2007		01/12/2007		01/17/2007	
Price Shift	P&L	Price Shift	P&L	Price Shift	P&L
-10	13.15K	-10	17.14K	-10	21.17K
-8 3/4	10.99K	-8 3/4	15.04K	-8 3/4	19.30K
-7 1/2	8.839K	-7 1/2	12.89K	-7 1/2	17.19K
-6 1/4	6.684K	-6 1/4	10.74K	-6 1/4	15.04K
-5	4.337K	-5	8.584K	-5	12.90K
-3 3/4	1.889K	-3 3/4	6.145K	-3 3/4	10.67K
-2 1/2	-559.80	-2 1/2	3.701K	-2 1/2	8.232K
-1 1/4	-3,009K	-1 1/4	1,257K	-1 1/4	5,793K
+0	-5,625K	+0	-1,218K	+0	3,353K
+1 1/4	-8,377K	+1 1/4	-3,966K	+1 1/4	725.32
+2 1/2	-11,13K	+2 1/2	-6,714K	+2 1/2	-2,018K
+3 3/4	-13,88K	+3 3/4	-9,462K	+3 3/4	-4,761K
+5	-16,76K	+5	-12,26K	+5	-7,506K
+6 1/4	-19,82K	+6 1/4	-15,32K	+6 1/4	-10,54K
+7 1/2	-22,88K	+7 1/2	-18,38K	+7 1/2	-13,59K
+8 3/4	-25,95K	+8 3/4	-21,44K	+8 3/4	-16,64K
+10	-29,07K	+10	-24,56K	+10	-19,76K

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Alternative Ways to Access Futures and Futures Options

Accessing Futures Exchange

With Bloomberg there are a number of different ways to access information. Instead of accessing contracts from the “Contract Table Menu” (CTM), futures and futures option information can alternatively be obtained by accessing the “Contract Exchange Menu” – CEM:

- Type CEM and then hit <go>

The CEM Screen provides a list of exchanges. From that screen, you can click the exchange of interest. This will bring up a screen listing the contracts on the selected exchange. For example, to access the Chicago Board of Exchange:

- Type CEM and hit <go> to bring up the ‘Contract Exchange Menu Screen’ (Exhibit E.4-15)
- Click CBT (or type the number) to bring up the contracts on the Chicago Board of Trade (Exhibit E.4-16)
- Click the desired commodity
- Click CT to pull up the ‘Contract Table’ on that commodity

Exhibit E.4-15: CEM

<HELP> for explanation, <MENU> for similar functions. N108c Comdty CEM
Enter # <Go> for a list of contracts.

CONTRACT EXCHANGE MENU Page 1/3

Sort By: Geographic

1) NYX American Stock Exchange	20) PHL Philadelphia Stock Exchange
2) CBF CBOT Futures Exchange	21) TCC The Clearing Corporation
3) CBT Chicago Board of Trade	22) EUS U.S. Futures Exchange
4) CBO Chicago Board Options Exchange	23) WCE Winnipeg Commodities Exchange
5) CME Chicago Mercantile Exchange	South America
6) CMX COMEX division of NYMEX	24) BMF Bolsa De Mercadorias & Futuros
7) ISE International Securities Exchan	25) BOV Bolsa de Valores de Sao Paulo
8) KCB Kansas City Board of Trade	26) SBA Merc. de Valores Buenos Aires
9) MDX Mercado Mexicano de Derivados	27) MBR Mercado a Termino Buenos Aires
10) MGE Minneapolis Grain Exchange	Europe
11) MSE Montreal Exchange	28) ADE Athens Derivative Exchange
12) NOL NOLX	29) BSE Budapest Stock Exchange
13) NYB NYBOT Exchange	30) EUX Eurex Deutschland (was DTB)
14) NYX NYBOT FINEX Exchange	31) EUZ Eurex Zurich
15) NYF NYBOT New York Futures Exchg	32) EOE Euronext Amsterdam
16) NCP NYMEX Clearport	33) EOC Euronext Amsterdam Commodity
17) NYM NYMEX Exchange	34) BFO Euronext Brussels
18) OCG OneChicago	35) BDP Euronext Lisbon
19) PBT Philadelphia Board of Trade	36) MAT Euronext Paris-Matif
	37) NNP Euronext Paris-Monep

Type CEPR <GO> for the FUTURES AND OPTIONS EXCHANGE DIRECTORY

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Exhibit E.4-16: CEM for CBT

<HELP> for explanation. N108c Comdty CEM
Enter # <Go> for a list of contracts.

Chicago Board of Trade Page 1 / 2

Security Type: All Display: Bid Price Sort By: Category
Screen Out: No Open Interest: Yes No Volume: Yes

Ticker	Description	Category	Type	Bid Price	Opt	MULT
1) USA Comdty	US Treasury Long Bond	BOND	Future	0.00	/	/
2) TUA Comdty	US Treasury Note, 2Yr	BOND	Future	0.00	/	/
3) FYA Comdty	US Treasury Note, 5Yr	BOND	Future	0.00	/	/
4) TYA Comdty	US Treasury Note, 10Yr	BOND	Future	0.00	/	/
5) C A Comdty	Corn	CORN	Future	0.00	/	/
6) YCA Comdty	Corn, Mini	CORN	Future	363.4	/	/
7) DJA Index	DJ Industrial Average	EQIX	Future	0.00	/	/
8) DMA Index	DJ Industrial Average Mini	EQIX	Future	12496	/	/
9) DNA Index	DJAIG Commodity Index\$N Ex	EQIX	Future	156.5	/	/
10) EEA Index	DJ Industrial Average Big	EQIX	Future	N.A.	/	/
11) HDA Index	DJ AIG	EQIX	Future	0.00	/	/
12) DLA Comdty	Denatured Fuel Ethanol	IMHT	Future	0.00	/	/
13) YHA Comdty	Binary Options	INTR	Future	0.00	/	/
14) FFA Comdty	Fed Fund, 30 Day	INTR	Future	94.755	/	/
15) O A Comdty	Oats	OGRN	Future	0.00	/	/
16) RRA Comdty	Rice, Rough	OGRN	Future	0.00	/	/
17) YGA Comdty	Gold, Mini	PMTL	Future	611.20	/	/
18) YSA Comdty	Silver, Mini	PMTL	Future	12.383	/	/
19) ZIA Comdty	Silver	PMTL	Future	12.390	/	/

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Accessing by Ticker

In addition to accessing contracts from CEM and CTM menus, futures contracts can also be accessed by typing the ticker and then hitting the yellow [CMDTY] key if the contract is a commodity, the yellow [Index] key if the contract is an index, and the yellow [CRNCY] key if it is a currency. To access many of the futures contract, Bloomberg’s ticker system follows a simple process of typing the root ticker, month, and year. For example, to access a Treasury-note futures expiring in September 2007, you would type TYU7:

- TY is the root ticker
- U is for September
- 7 is for 2007

Exhibit E.4-17 shows some of Bloomberg’s common root tickers and month codes:

Exhibit E.4-17: Bloomberg Root tickers and Month Codes

Root Tickers	Bloomberg Key	Month Codes
TY – 10 year Treasury note	[CMDTY]	January F
FV – 5 year Treasury note	[CMDTY]	February G
US – Treasury long bond	[CMDTY]	March H
FF – 30 day Fed Fund	[CMDTY]	April J
CL – Crude Oil (NYMEX)	[CMDTY]	May K
NG – Natural Gas (NYMEX)	[CMDTY]	June M
HU – Gasoline	[CMDTY]	July N
ED – Eurodollar 3Mo	[CMDTY]	August Q
SP – S&P 500	[INDEX]	September U
DJ – DJIA	[INDEX]	October V
ND – NASDAQ 100	[INDEX]	November X
RL – Russell 2000	[INDEX]	December Z
EUR – Euro	[CRNCY]	
JPY – Yen	[CRNCY]	
GBP – British Pound	[CRNCY]	

Note that instead of identifying a specific expiration, you can type an “a” after the root ticker to bring up the most actively traded contract. For example, typing SPA [INDEX] brings up the most actively traded S&P 500 futures contract. Bloomberg also allows one to generate generic contracts. This can be done by adding a number to the end of the root ticker (e.g., a generic future is made that is 7 months from expiration). This can be helpful when graphing prices over a long period of time. For example, CL1 [CMDTY] GP pulls up a price graph of a generic first month future for crude oil. Depending on the underlying security, a generic can be produced up to 70 months.

Summary and List of Bloomberg Functions for Futures and Futures Options

Once a futures or futures option contract is loaded, Bloomberg functions can be applied by simply typing the function in the top left corner. Some of the functions that we’ve already described and some new ones are listed below. Included with some of the functions are the function’s related screens accessed for futures contracts on a U.S. T-Bond and the S&P 500 (on January 9, 2007).

- DES: Futures Contract Description** gives information such as contract size, delivery date, contract months available, available generics, related functions, and a brief written description of the underlying product:

Exhibit E.4-18: DES for T-Bond and S&P 500 Futures

N108 Comdty DES

Type # <GD> For Related Function

Futures Contract Description Page 1/2

N Exchange (CBT) Chicago Board of Trade		Related Functions	
Name	US LONG BOND(CBT) Mar07	1) CT	Contract Table
Ticker	USH7 <CHDTY>	2) FHG	Futures History Graph
Notional	US 20yr 6%	3) EXS	Expiration Schedule
Contract Size	USD 100,000	4) DLV	Cheapest to Deliver
Value of 1.0 pt	\$ 1,000	5) ECO	US Economic Releases
Tick Size	0-01 (32nds)	Margin Limits	
Tick Value	\$ 31.25	Speculator	Hedger
Current Price	112-04 points	Initial	1350 1000
Contract Value	\$ 112,125 @ 15:00:00	Secondary	1000 1000
Cycle --- Mar --- Jun --- Sep --- Dec			
Trading Hours		U.S. Treasury bonds that, if callable, are not callable for at least 15 years from the first day of the delivery month or, if not callable, have a maturity of at least 15 years from the first day of the delivery month. Please see EUSA <comdty> for e-CBOT platform.	
Chicago Local	18:00-16:00 19:00-17:00	Life High	115-01
Chicago Local	07:20-14:00 08:20-15:00	Life Low	105-03
First Delivery	Thu Mar 1, 2007	Generics Available	
Last Delivery	Fri Mar 30, 2007	US1	<CHDTY>
Last Trade	Wed Mar 21, 2007	Through	
First Notice	Wed Feb 28, 2007	US5	<CHDTY>
First Trade	Wed Dec 21, 2005		

Australia 61 2 3777 8600 Brazil 5511 2048 4500 Europe 44 20 7330 7500 Germany 49 69 320410 Hong Kong 852 2577 6000 Japan 81 3 3201 8500 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2007 Bloomberg L.P. H04-668-2 09-Jan-2007 18:01:41

N108 Index DES

Type # <GD> For Related Function

Futures Contract Description Page 1/2

N Exchange (CHE) Chicago Mercantile Exchange		Related Functions	
Name	S&P 500 FUTURE Mar07	1) CT	Contract Table
Ticker	SPH7 <INDEX>	2) FHG	Futures History Graph
Contract Size	250 \$ x index	3) EXS	Expiration Schedule
Value of 1.0 pt	\$ 250	4) OCM	Option Custom Monitor
Tick Size	.1	5) FVD	Fair Value Detail
Tick Value	\$ 25	Margin Limits	
Current Price	1420.50 index points	Speculator	Hedger
Contract Value	\$ 355,125 @ 16:18:18	Initial	17500 14000
Cycle --- Mar --- Jun --- Sep --- Dec		Secondary	14000 14000
Trading Hours		To access the night (GLOBEX) session type	
Chicago Local	15:30-08:15 16:30-09:15	GSPA	<INDEX> <GD>
Chicago Local	08:30-15:15 09:30-16:15	To access the special opening quotation of the S&P 500 Index for purposes of final settlement on valuation day type SPXM <INDEX>	
Cash Settled		Life High	1,444.90
Valuation Date	Fri Mar 16, 2007	Life Low	1,179.50
Last Trade	Thu Mar 15, 2007	Generics Available	
First Trade	Fri Mar 18, 2005	SP1	<INDEX>
		Through	
		SP8	<INDEX>

Australia 61 2 3777 8600 Brazil 5511 2048 4500 Europe 44 20 7330 7500 Germany 49 69 320410 Hong Kong 852 2577 6000 Japan 81 3 3201 8500 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2007 Bloomberg L.P. H04-668-2 09-Jan-2007 18:13:40

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- CT: Contract Table** displays the outstanding contracts:

Exhibit E.4-19: CT for T-Bond and S&P 500 Futures

N127 Comdty CT

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

Enter # <GD> to scroll contracts. Run EXCH for realtime authorized exchanges

Session: PTT

US LONG BOND(CBT) Contract Table Delayed monitoring enabled

Exchange Web Page Pricing Date: 17 9707 Price Display: 0

Chicago Board of Trade Delayed prices

Grey date = options trading

Last	Change	Time	High	Low	OpenInt	TotVol	Previous Close	
1USH7	Mar07	112-04s	unch	Close	112-09	111-31	770134 12525	112-04
2USH7	Jun07	112-02s	unch	Close	112-05	111-31	6497 1402	112-02
3USU7	Sep07	112-02s	unch	Close			2 0	112-02
4USZ7	Dec07	112-02s	unch	Close			32 0	112-02
5USHB	Mar08						0 0	

Australia 61 2 3777 8600 Brazil 5511 2048 4500 Europe 44 20 7330 7500 Germany 49 69 320410 Hong Kong 852 2577 6000 Japan 81 3 3201 8500 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2007 Bloomberg L.P. H04-668-2 09-Jan-2007 18:02:42

N127 Index CT

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

Enter # <GD> to scroll contracts. Run EXCH for realtime authorized exchanges

Session: PTT

S&P 500 INDEX Contract Table Delayed monitoring enabled

Exchange Web Page Pricing Date: 17 9707

Chicago Mercantile Exchange Delayed prices

Grey date = options trading

Last	Change	Time	High	Low	OpenInt	TotVol	Previous Close	
1SPX	spot	1412.11					0 0	1412.84
2SPH7	Mar07	1420.50s	-2.00	Close	1425.00	1414.00	605742 36194	1422.50
3SPH7	Jun07	1433.30s	-2.00	Close	1437.80b	1426.50a	13051 425	1435.30
4SPU7	Sep07	1446.70s	-1.80	Close			11223 0	1448.50
5SPZ7	Dec07	1459.10s	-1.80	Close			1812 0	1459.30
6SPHB	Mar08	1469.60s	-1.80	Close			315 0	1471.40
7SPHB	Jun08	1481.10s	-1.80	Close			60 0	1482.90
8SPUB	Sep08	1492.60s	-1.80	Close			0 0	1494.40
9SPZB	Dec08	1504.10s	-1.80	Close			0 0	1505.90

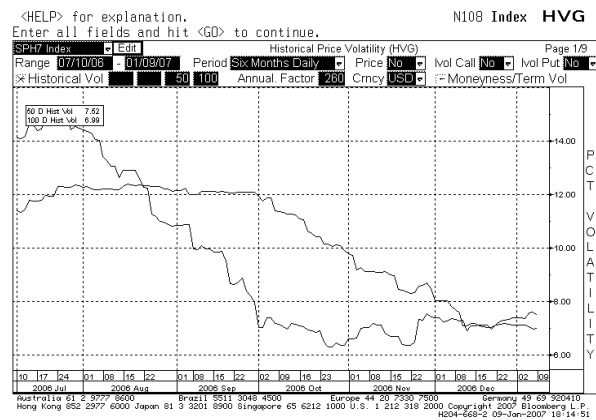
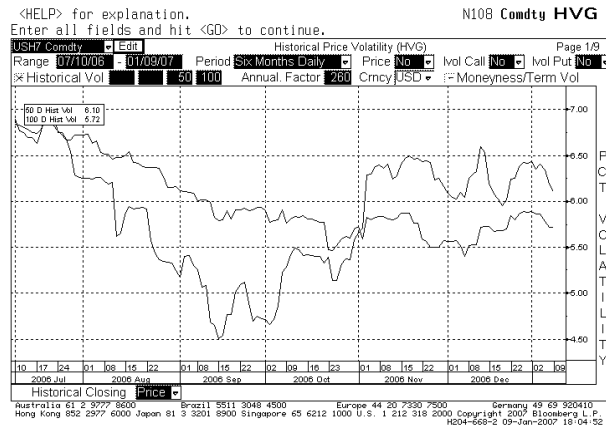
Australia 61 2 3777 8600 Brazil 5511 2048 4500 Europe 44 20 7330 7500 Germany 49 69 320410 Hong Kong 852 2577 6000 Japan 81 3 3201 8500 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2007 Bloomberg L.P. H04-668-2 09-Jan-2007 18:14:06

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- CTG: Contract Table Graph** displays in graph format the prices for the series of futures contracts.

4. **HVG: Historical Volatility** graph displays the historical volatility on the futures contract:

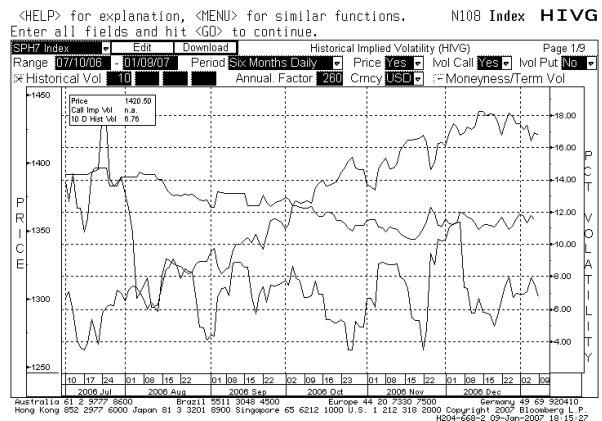
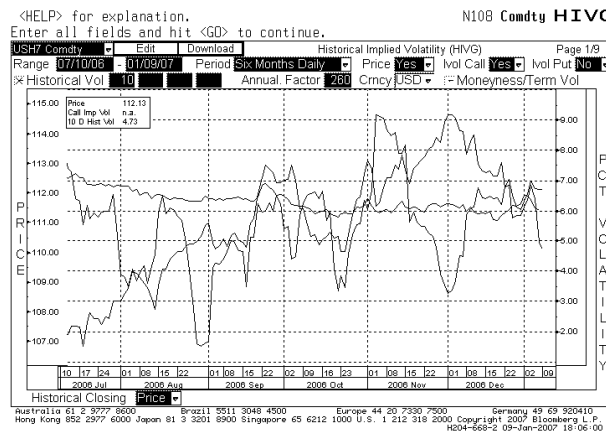
Exhibit E.4-20: HVG for T-Bond and S&P 500 Futures



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5. **HIVG: Historical Implied Volatility** graph displays historical implied volatilities on futures:

Exhibit E.4-21: HIVG for T-Bond and S&P 500 Futures



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6. **OMON: Option Monitor** displays options on the given futures contract; function is the same as the monitor for options on a stock and is fully customizable.

7. **FHG: Futures History Graph** displays customizable graphs, volatility, price, and other descriptive information.

8. **EXS: Expiration Schedule** displays important dates such as last trade and contract delivery dates:

Exhibit E.4-22: EXS for T-Bond and S&P 500 Futures

N108 Index **EXS**

Relevant Dates p. 1/2

<HELP> for explanation, <MENU> for similar functions. N108 Comdty **EXS**

US LONG BOND(CBT)						
Expiration Dates From (MM/YY): 1/07						
Ticker	Month	Last Trade	First Notice	First Delivery	Last Delivery	Last Price
USH7	Mar07	3/21/07	2/28/07	3/1/07	3/30/07	112-04
USH7	Jun07	6/20/07	5/31/07	6/1/07	6/29/07	112-02
USH7	Sep07	9/19/07	8/31/07	9/4/07	9/28/07	112-02
USZ7	Dec07	12/19/07	11/30/07	12/3/07	12/31/07	112-02
USH8	Mar08	3/19/08	2/29/08	3/3/08	3/31/08	n/a

Relevant Dates p. 1/2

<HELP> for explanation, <MENU> for similar functions. N108 Index **EXS**

S&P 500 FUTURE						
Expiration Dates From (MM/YY): 1/07						
Ticker	Month	Last Trade	First Notice	First Delivery	Last Delivery	Last Price
SPH7	Mar07	3/15/07	3/15/07	3/16/07	3/16/07	1420.50
SPH7	Jun07	6/14/07	6/14/07	6/15/07	6/15/07	1433.30
SPU7	Sep07	9/20/07	9/20/07	9/21/07	9/21/07	1446.70
SPZ7	Dec07	12/20/07	12/20/07	12/21/07	12/21/07	1458.10
SPH8	Mar08	3/19/08	3/19/08	3/21/08	3/21/08	1469.60
SPH8	Jun08	6/19/08	6/19/08	6/20/08	6/20/08	1481.10
SPU8	Sep08	9/18/08	9/18/08	9/19/08	9/19/08	1492.60
SPZ8	Dec08	12/18/08	12/18/08	12/19/08	12/19/08	1504.10

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9. **FVD: Fair Value Detail** calculates the fair value of the two contracts closest to expiration compared to the index (only available with index futures).
10. **DLV: Cheapest to Deliver.** Lists all T-bonds or T-notes that are able to be delivered to the selected futures contract and identifies the cheapest (only available with T-bond and T-note futures):

Exhibit E.4-23: DLV for T-Bond Futures

<HELP> for explanation, <MENU> for similar functions. N108 Comdty **DLV**

Hit (NUMBER) <GO> to view Historical Basis/Repo

Cheapest to Deliver

US LONG BOND(CBT) Jun07 **USM7** 112-02

Trade 1/ 9/07 Div 6/29/07 p. 1 / 2

Set 1/10/07 Cheapest IRP= 5.16

PRICES AS DECIMALS: (Mid) Conv. (32nds) Gross Implied Actual (32nds) Net

Order DR re-sort? Price Source Yield C.Factor Basis Repo% Basis

Order	DR	re-sort?	Price	Source	Yield	C.Factor	Basis	Repo%	Basis			
1)	T	7	1/4	08/15/22	126-03+	BGN	4.845	1.1225	10.2	5.16	5.16	.0
2)	T	7	5/8	11/15/22	130-17	BGN	4.842	1.1607	14.7	5.03	5.16	2.6
3)	T	7	1/8	02/15/23	125-07	BGN	4.850	1.1125	17.6	4.71	5.16	8.6
4)	T	6	1/4	08/15/23	115-26+	BGN	4.850	1.0255	29.1	3.69	5.16	25.8
5)	T	7	1/2	11/15/24	131-16	BGN	4.843	1.1597	49.3	3.16	5.16	39.8
6)	T	7	5/8	02/15/25	133-07	BGN	4.847	1.1746	50.9	3.14	5.16	40.6
7)	T	6	5/8	08/15/25	124-22	BGN	4.845	1.0955	61.5	2.20	5.16	55.8
8)	T	6	3/4	08/15/26	123-30+	BGN	4.843	1.0843	78.2	1.22	5.16	73.8
9)	T	6	02/15/26	114-09	BGN	4.845	1.0000	71.0	1.09	5.16	70.3	
10)	T	6	1/2	11/15/26	121-02	BGN	4.837	1.0565	85.4	.65	5.16	82.6
11)	T	6	5/8	02/15/27	122-27	BGN	4.835	1.0713	89.3	.53	5.16	85.9
12)	T	6	3/8	08/15/27	119-31+	BGN	4.832	1.0433	98.2	-.15	5.16	96.4
13)	T	6	1/8	11/15/27	116-31+	BGN	4.823	1.0144	105.9	-.80	5.16	105.5
14)	T	5	1/2	08/15/28	109-00+	BGN	4.823	.9407	115.1	-1.99	5.16	117.8
15)	T	6	1/8	08/15/29	117-30+	BGN	4.813	1.0152	134.0	-2.37	5.16	134.3
16)	T	5	1/4	11/15/28	105-27	BGN	4.814	.9105	121.9	-2.71	5.16	126.0

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11. **OSA** evaluates a position composed of futures and calls and puts on the futures contract.

12. **OHTX: Option Position Horizon Analysis** evaluates a position composed of calls and puts on the futures contract.

Exhibit E.4-24: OHTX for S&P 500 Futures

<HELP> for explanation. N108 Index OHTX
 Option type: American Calc type: European Hit 1<GO> for calc defaults
 19:23 OPTION POSITION HORIZON ANALYSIS
 Tue 1/9 FEB OPTIONS ON S&P 500 FUTURE Mar07
 SPH7

MARKET IS CLOSED						POSITION SIZE					
CALLS			PUTS			-A-		-B-		-C-	
Stk	Price	Del	I.Vol	Price	Del	Call	Put	Call	Put	Call	Put
1405	29.80s	.62	11.72	14.40s	.38						
1410	26.40s	.58	11.46	16.00s	.41						
1415	23.20s	.55	11.21	17.70s	.45						
1420	20.10s	.51	10.92	19.60s	.49						
1425	17.20s	.47	10.62	21.70s	.53						
1430	14.70s	.43	10.44	24.10s	.57						
1435	12.30s	.38	10.19	26.70s	.61						
1440	10.20s	.34	9.98	29.60s	.65						

TODAY 38 days to Fri (2/16/07)Exp
 SPH7 @ 1420.50

WHAT IF?	Call	Vol	Put
1 Day	1420.50	unch	Same
7 Days	1420.50	unch	Same
14 Days	1420.50	unch	Same
21 Days	1420.50	unch	Same
38 Exp	1420.50	unch	Same

-A-	-B-	-C-
THEN	P&L	
+0.00	+0.00	+0.00
+0.00	+0.00	+0.00
+0.00	+0.00	+0.00
+0.00	+0.00	+0.00
+0.00	+0.00	+0.00

SCENARIO SET # 0 1-8 or 0-CUSTOM, hit <HELP>
 Australia 61 2 3977 8600 Brazil 5511 3048 4800 Europe 44 20 7330 7800 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2007 Bloomberg L.P.
 H204-666-1 09-Jan-2007 19:23:11

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13. **SKEW** displays implied volatility for different exercise prices, providing a volatility smile.

14. **HEDG: Hedging Stock Positions with Index Futures with HEDG:** HEDG calculates the number of futures contracts needed to hedge a selected equity security from a calculated beta. To apply: Enter company [EQUITY] HEDG; for example: IBM [EQUITY] HEDG

Exhibit E.4-25: HVG for IBM

Menu P141h Equity HEDG

Equity Hedge Screen	
DEPENDENT VARIABLE IBM US INTL BUSINESS MACHINES CORP Latest Price 99.340 Shares held 10000 Market Value 993,399.96 Currency USD	INDEPENDENT VARIABLE S&P Index S&P 500 FUTURE Mar07 Latest Price 1440.8 Contract Size 250 Contract Value 360,200.00 Currency USD Cross Rate 1.00
Beta (Adj/Raw) 1.061/1.091 t-Test 7.4956 # Points 103 Frequency Weekly	Dates: 1/21/05 to 1/12/07 Alpha -0.12434 r-squared 0.3574
Market Value X Beta = Risk-adjusted market value 993,399. 1.091 1,084,062.61 divided by Contract Value = Number of Contracts 360,200.00 3.01	

Australia 61 2 3977 8600 Brazil 5511 3048 4800 Europe 44 20 7330 7800 Germany 49 69 920410
 Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2007 Bloomberg L.P.
 H204-666-1 15-Jan-2007 18:06:41

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15. **FYH: Hedging Bond Positions with Interest Rate Futures with FYH:** FYH calculates the number of futures contracts needed to hedge a fixed income security (corporate, government or mortgage). FYH displays four different futures contracts. To use, load a fixed income security and type FYH. For example: enter IBM [CORP]; select bond: IBM, 7.5%, maturing 6/15/13; type FYH:

Exhibit E.4-26: FYH for IBM Bond

```

Menu                                     P141h Corp  FYH
Futures Yield-Shift (Duration) Hedging
BUY  IBM 7 1/2 06/15/13    Risk 5.72  Set 
Workout Dt  @      Yld  E/C      Trade 

Yield Beta 
Sell Futures      Futures      Hedge Number Proxy Security for Futures Valuation
Size Contract    Price      of Futures      Issue      Yield Risk C Factor
US 100M CBT US 20yr 6%
   USH7 Mar07 Y110-26 5.2  4.96 12.46 1.1236
   USM7 Jun07 Y110-23 5.2  4.96 12.46 1.1225
TV 100M CBT US 10yr 6%
   TYH7 Mar07 Y107-03# 9.2  4.76 5.67 .9069
   TYM7 Jun07 Y107-03# 8.8  4.77 5.79 .8937
FV 100M CBT US 5yr 6%
   FVH7 Mar07 Y104-25# 14.0  4.75 3.91 .9590
   FVM7 Jun07 Y104-28# 13.3  4.76 4.09 .9499
TU 200M CBT US 2yr 6%
   TUH7 Mar07 Y101-29 15.3  4.88 1.84 .9794
   TUM7 Jun07   .00 .00 .9447

Choices: US TY FV ED TB TU MB  RX DE DU A  G L  MN FM JB JJ N  <help>
FX rates:  $=1.00  €   £   Ffr   ¥   A$ 
Australia 61 2 9777 8600  Brazil 5511 3048 4500  Europe 44 20 7330 7500  Germany 49 69 920410
Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2007 Bloomberg L.P.
H250-668-0 15-Jan-2007 18:24:39

```

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16. **Foreign Currency Spot and Forward Contract Functions:** Bloomberg provides a number of functions, analytics, and data on spot and forward exchange rates.

1. **FXC** provides a matrix of spot and forward rates for 11 key currencies. To access, enter [CRNCY] FXC:

Exhibit E.4-27: FXC

```

<HELP> for explanation.                                     N108 Curncy FXC
18:10
Thu 1/11
KEY CROSS CURRENCY FORWARDS

USD EUR JPY GBP CHF CAD AUD NZD HKD NOK SEK
SEK 7.0535 9.1298 5.9256 13.709 5.6886 6.0038 5.4903 4.8357 .9076 1.0910 ....
NOK 6.4652 8.3684 5.4314 12.566 5.2141 5.5031 5.0324 4.4324 .8319 .... .9166
HKD 7.7720 10.060 6.5293 15.106 6.2681 6.6154 6.0496 5.3283 .... 1.2021 1.1019
NZD 1.4586 1.8880 1.2254 2.8350 1.1764 1.2416 1.1354 .... .1877 .2256 .2068
AUD 1.2847 1.6629 1.0793 2.4970 1.0361 1.0935 .... .8808 .1653 .1987 .1821
CAD 1.1748 1.5207 .9870 2.2835 .9475 .... .9145 .8054 .1512 .1817 .1666
CHF 1.2399 1.6049 1.0417 2.4100 .... 1.0554 .9651 .8501 .1595 .1918 .1758
GBP .5145 .6660 .4322 .... .4149 .4379 .4005 .3527 .0662 .0796 .0729
JPY 119.03 154.07 .... 231.36 96.000 101.32 92.653 81.606 15.316 18.411 16.876
EUR .7726 .... .6490 1.5016 .6231 .6576 .6014 .5297 .0994 .1195 .1095
USD .... 1.2944 .8401 1.9436 .8065 .8512 .7784 .6856 .1287 .1547 .1418
(x100)
[Mo] Enter 1M,2M etc. for forward rates  [E] EURO  [D] Default Currencies
Hit -1,-2...<Page> for previous days  [A] Show all
monitoring enabled:  decrease  increase  no change  BLOOMBERG Composite
Australia 61 2 9777 8600  Brazil 5511 3048 4500  Europe 44 20 7330 7500  Germany 49 69 920410
Hong Kong 852 2977 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2007 Bloomberg L.P.
H204-668-0 11-Jan-2007 18:10:55

```

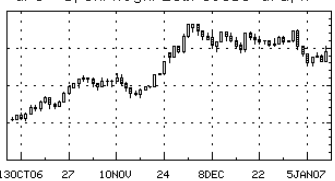

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2. **BQ** displays currency exchange quotes and key functions related to select currencies. To access, enter currency identifier [CRNCY] BQ; for example, for the British pound, enter GBP [CRNCY] BQ:

Exhibit E.4-28: BQ for British Pound

GBP ↓ 1.9443 - .0009 ANON 1.9443/1.9444 ANON
 At 18:05 Op 1.9452 Hi 1.9453 Lo 1.9437 Prev 1.9453 Value 1/16/07

BRITISH POUND SPOT

1) CO Best Bid/Ask Rates 18:05 ANON/NYC 1.9443 1.9444 ANON/NYC	2) FXC Key Cross Rate Monitor 3) ERM Exchange Rate Mechanism
4) ALLQ Rates from all Sources Time Bid_Src Bid Ask Ask_Src 18:05 ANON/NYC 1.9443 1.9445 ANON/NYC 18:04 ANON/NYC 1.9443 1.9445 WACH 18:04 ANON/NYC 1.9443 1.9445 ANON/NYC	5) CM Currency Market Monitors USD/GBP GBP/EUR SP 1.9443 5 .6631 2 1M 0 0 10 10 2M -2 -2 19 19 3M -5 -5 28 28 6M -21 -20 56 56
6) GPC Open/High/Low/Close Graph 	7) GIP Intraday Price Graph 
8) N BN 17:53 Currency Trading Surges as British Pound Climbs, Yen Tumbles Fx BN 17:40 Dollar Heads for Weekly Gain Before U.S. Retail Sales Report New BN 17:15 British Pound Moving Average, Relative Strength, Pivots (Table)	

Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
 Hong Kong 852 2377 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2007 Bloomberg L.P.
 H204-668-0 11-Jan-2007 18:05:15

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3. **BBC** provides a menu of currency market monitor screens (e.g., spot and forward rates). Type BBC, then select monitor. Exhibit E.4-29 shows spot and forward rate spreads.

Exhibit E.4-29: BBC Spot and Forward Spreads

Backpage N121 Curncy CM1
 Screen saved as U:\Derivative Book Chapters\BLOOMB~3\IBMOPT~1\bbc.gif
 9:00 **BLOOMBERG COMPOSITE** PAGE 1 / 6

Euro (EUR)				British Pounds (GBP)			
BID	ASK	BID	ASK	BID	ASK	BID	ASK
SOURCE	SOURCE	SOURCE	SOURCE	SOURCE	SOURCE	SOURCE	SOURCE
1) SPOT ANON/NYC 1.3008	1.3008 BBRG/NYC	17) SPOT WLBN 1.9491	1.9493 WLBN				
2) 0/N TTOL/LON 1.85	1.86 TTOL/LON	18) 0/N TTOL/LON 0.01	0.03 PYEN/LON				
3) T/N TTOL/LON 0.62	0.62 TTOL/LON	19) T/N BBRG/NYC 0.01	0.01 ANON/NYC				
4) 1M ANON/NYC 17.02	17.05 ANON/NYC	20) 1M ANON/NYC -0.40	-0.20 ANON/NYC				
5) 2M NORD 33.30	33.30 NORD	21) 2M ANON/NYC -3.08	-2.78 ANON/NYC				
6) 3M ANON/NYC 49.35	49.55 TTOL/LON	22) 3M ANON/NYC -6.70	-6.30 ANON/NYC				
7) 6M ANON/NYC 92.60	93.10 ANON/NYC	23) 6M ANON/NYC -24.00	-21.60 ANON/NYC				
8) 12M WLBN 164.60	165.45 ANON/NYC	24) 12M TTOL/LON -72.70	-69.70 TTOL/LON				
Japanese Yen (JPY)				Swiss Franc (CHF)			
9) SPOT TTOL/LON 121.72	121.73 GLBX	25) SPOT ZKBU/ZUR 1.2474	1.2476 ANON/NYC				
10) 0/N BBRG/NYC -6.60	-6.58 TTOL/LON	26) 0/N TTOL/LON -3.40	-3.35 TTOL/LON				
11) T/N TTOL/LON -1.66	-1.65 ANON/NYC	27) T/N ANON/NYC -1.15	-1.10 ANON/NYC				
12) 1M WLBN -45.95	-45.88 NFXT/LON	28) 1M TTOL/LON -31.15	-30.95 TTOL/LON				
13) 2M ANON/NYC -99.10	-98.95 ANON/NYC	29) 2M ANON/NYC -64.15	-63.65 ANON/NYC				
14) 3M NFXT/LON -143.50	-143.50 WLBN	30) 3M WLBN -97.00	-96.50 WLBN				
15) 6M NFXT/LON -286.75	-286.50 ANON/NYC	31) 6M WLBN -188.40	-186.90 WLBN				
16) 12M ANON/NYC -552.45	-552.00 ANON/NYC	32) 12M TKFE/LON -351.90	-347.90 TTOL/LON				

For a list of source abbreviations type QFX <GD> 1 <GD>
 Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 920410
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E.5 SETTING UP A PORTFOLIO

A user can set up a stock or fixed-income portfolio on Bloomberg. Once the portfolio is loaded, the user can obtain current market information and apply Bloomberg analytics to analyze the portfolio. For portfolio derivative analysis, a number of option functions can be applied, such as option scenario analysis (OSA).

Steps for Creating Portfolios

- Step 1: PRTU:** PRTU displays a list of portfolios. To create a portfolio using PRTU:
 - Type PRTU
 - On PRTU Screen, click the “Create New” button. This will bring up a three-page screen for inputting information:
 - Page 1: Name of your portfolio, Asset Class (Equity, fixed income, balanced), and Benchmark (e.g., S&P 500)
 - Page 2: Screen for inputting securities by their identifiers (Note: A helpful way to load securities is to go to the index and find the securities of interest; then drop and drag the security)
 - Page 3 identifies the defaults
 - Once the portfolio is loaded, hit the menu key. The name you have given to the portfolio will then be displayed on the PRTU Screen.

Exhibit E.5-1 shows page 1 and 2 of the PRTU Screens from loading a four-security energy stock portfolio, named Energy Stock Portfolio: Conoco Phillips, Exxon Mobile, Marathon Oil, and Royal Dutch Shell. This portfolio is evaluated relative to the American Stock Exchange Oil Index XOI = identifier)).

Exhibit E.5-1: PRTU

The left screenshot shows the 'Portfolio Defaults' screen for 'ENERGYSTOCK PORTFOLIO'. The fields are as follows:

Holder Name	XAMER UNIVERSITY	Portfolio ID	U3013202-3
Name	ENERGYSTOCK PORTFOLIO		
Asset Class	Equity		
Portfolio Base Currency	USD		
Benchmark	XOI	Please enter an Index Ticker.	
Filing Date	01/15/07		
Notes			
Cash Amount	0	Update the cash amount through 'PTT' YES	
Cash Yield (%)	0.00	Used in PSA/PSH/PRTS Functions	
Basket Ticker	2134226	Last Update	1/15/2007

The right screenshot shows the 'Portfolio Defaults' screen with a table of securities:

Security	Identifier	Position	Mkt Px	Mkt Val	Cost P/A
1) COP UN	COP	1000.000	63.8300	63.830M	
2) MRO UN	MRO	1000.000	86.7700	86.770M	
3) RDSA UN	US7802592060	1000.000	67.6100	67.610M	
4) XOM UN	XOM	1000.000	72.6600	72.660M	

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- Step 2: PER:** Type PER to run the portfolio, then hit 1 <go>. The PER function accesses the stocks and their current values and sends the information to a report file.
- Step 3: RPT:**

- Type RPT for a listing of reports
- Click the one just completed (See Exhibit E.5-2)

4. **Step 4: PMEN:** With the portfolio loaded, type PMEN to access a menu of functions to apply to the portfolio: Display and Valuation, Equity Analytics, News and Research headlines. For example, clicking the “News and Research” function (NPH) for the Energy Stock Portfolio displays current news listings for each stock in the portfolio (see Exhibit E.5-3).

Exhibit E.5-2: RPT

1 P181 Client RPT

Hit # <GO> to View Securities within each Market Sector.

Equity Portfolio Risk Report PAGE 1 / 1

Holder Name: XAVIER UNIVERSITY	Name: ENERGYSTOCK PORTFOLIO
Portfolio: U3013202-3	
# of Issues: 4	Stock Avg Beta: 1.27
Risk Value (\$): 3,684.84	Futures Value(\$): 291,070.00

Market Breakdown	MktValue	Beta	RiskHmt	Futr	MktValue	Zof	RiskHmt	Zof	
U.S.	6	291.07M	1.27	3,684.84	H	291.07M	100.0	3,684.84	100.0

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Exhibit E.5-3: NPH

Enter 21 <GO> for Portfolio News Defaults Client NPH

Portfolio Headlines. Enter Selection To View Story

1) CONOCOPHILLIPS (COP)
2) BN 19:35 Venezuela Seeks Cuts in World, Local Oil Production (Update2)
3) BN 18:39 Chevron, Shell Delay LNG Projects, Sending Natural Gas Higher
4) BN 17:38 Venezuela Wants Oil, Joint Venture Output Slashed (Update1)
5) MARATHON OIL CORP (MRO)
6) BN 18:39 Chevron, Shell Delay LNG Projects, Sending Natural Gas Higher
7) PRN 1/12 Seven Summits Research Releases Comments on HFO, MRO, RZN,
8) BN 1/11 *NO MARKET ON CLOSE IMBALANCE: MRO (NYSE)
9) ROYAL DUTCH SHELL PLC-AD(RDS/A)
10) BN 18:39 Chevron, Shell Delay LNG Projects, Sending Natural Gas Higher
11) BN 18:01 Dutch Gas Boom Bypasses People Who Live Closest to Its Source
12) PRN 13:05 ROYAL DUTCH SHELL PLC: Buyback of Dum Shares
13) EXXON MOBIL CORP (XOM)
14) BN 19:35 Venezuela Seeks Cuts in World, Local Oil Production (Update2)
15) BN 18:39 Chevron, Shell Delay LNG Projects, Sending Natural Gas Higher
16) BN 18:01 Dutch Gas Boom Bypasses People Who Live Closest to Its Source

Portfolio ID#: 3 JAMES PAULIKIEWICZ - XAVIER UNI

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Step 5 OPSA: Accessing options on the stocks in the portfolio: From the Equity Analytics Screen, you can access the option scenario screen (OPSA/OSA). On that screen, click the amber source key. This will bring a drop-down menu listing portfolios (e.g., indices and favorites). This list includes portfolios formed in PRTU (e.g., the Energy Stock Portfolio). Clicking the desired portfolio will bring up its stocks. Once the portfolio’s stocks are loaded, the user can click the “Add Option” button to access options traded on each of stocks in the portfolio. Options can then be added to the each stock to generate an option and stock position. Exhibit E.5-4 shows the OPSA/OSA screen on January 15, 2007 for the energy stock portfolio in which each stock has added to its position 1000 near-the-money put options expiring in February 2008; Exhibit E.5-5 shows the OSA profit tables for one of the energy stocks (Exxon Mobile).

Exhibit E.5-4: OSA

<HELP> for explanation. dgp Comdty OSA

Security	Price	Position	Cost	P&L	Delta	Theta	Vega
COP US Equity	63.83	1000.00	63.83	0.00	1.00K	0.00	0.00
L-COP US 807 P65.00	5.43K	1000.00	5.40	-20.00K	-48.57K	-774.14	19.12K
MRO US Equity	66.77	1000.00	66.77	0.00	1.00K	0.00	0.00
L-MRO US 108 P65.00	8.04K	1000.00	8.32	-30.00K	-39.51K	-871.19	32.71K
RDSIA US Equity	67.81	1000.00	67.81	0.00	1.00K	0.00	0.00
L-RDSIA US 108 P65.00	3.20K	1000.00	3.60	-40.00K	-36.79K	-296.80	24.62K
XOM US Equity	72.66	1000.00	72.66	0.00	1.00K	0.00	0.00
L-XOM US 108 P72.50	5.30K	1000.00	5.50	-20.00K	-42.87K	-477.36	27.69K

Scenarios For:	KOM US Equity	Defaults	P&L From:	Portfolio	Advanced					
Price	Vol	Date	Rate	P&L	F&L(%)	Delta	Gamma	Theta	Vega	
1)	77.50	0.00	01/22/07	0.00	-194.5K	-31.23	-29.92K	2.236K	-423.19	26.47K
2)	76.00	0.00	01/22/07	0.00	-113.2K	-18.18	-35.85K	2.573K	-394.62	27.29K
3)	72.50	0.00	01/22/07	0.00	-16.58K	-2.66	-42.44K	2.722K	-346.71	27.50K
4)	70.00	0.00	01/22/07	0.00	87.91K	15.72	-49.65K	2.894K	-246.81	27.07K
5)	67.50	0.00	01/22/07	0.00	231.5K	37.18	-57.33K	3.173K	-172.02	25.12K

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Exhibit E.5-5: OSA Profit Table

<HELP> for explanation. dgp Comdty OSA

<MENU> Return to previous Screen

Security	Price	P&L	Delta	Theta	Vega
XOM US Equity	85.00	85.00	0.00	0.00	0.00
L-XOM US 108 P72.50	85.00	85.00	0.00	0.00	0.00

01/15/2007	01/20/2007	01/25/2007	01/19/2008
Price	P&L	Price	P&L
85.00	385.5K	85.00	384.7K
86.25	338.9K	86.25	385.8K
87.50	233.6K	87.50	232.3K
88.75	164.5K	88.75	162.9K
90.00	100.4K	90.00	98.73K
91.25	41.71K	91.25	39.76K
92.50	-13.47K	92.50	-15.63K
93.75	-63.86K	93.75	-66.03K
95.00	-109.9K	95.00	-114.6K
96.25	-153.1K	96.25	-157.9K
97.50	-191.1K	97.50	-193.5K
98.75	-226.6K	98.75	-229.0K
100.00	-263.7K	100.00	-261.0K
101.25	-297.3K	101.25	-292.1K
102.50	-314.1K	102.50	-316.4K
103.75	-336.9K	103.75	-339.2K
105.00	-358.6K	105.00	-360.8K

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Note: Pressing the graph button on OSA's graph screen brings down a menu listing other variables that you can evaluate: market values and Greeks. Also, depending on the Bloomberg access agreement, the profit and loss data for each option can be downloaded to Excel file where the entire portfolio can be evaluated.

E.6 GETTING STARTED ON OTHER DERIVATIVES FUNCTIONS

In addition to spot options, warrants, futures, and futures options, there are also Bloomberg functions on swaps, interest rate derivative products, credit derivatives, convertible bonds, and asset-backed securities. As a guide to getting started, this section defines some of the Bloomberg functions that can be used to access information on swaps, credit derivatives, convertibles, and asset-backed securities. In examining these functions, remember there is usually an extensive help page included with most Bloomberg functions. More information on other derivatives also can be found by typing NI BUSEMR to access the a Bloomberg tutorial on the subject.

Interest Rate Swaps and Other Interest Rate Products

Interest Rate Swap Functions

SWPM Swap Manager creates and evaluates interest rate products: Interest rate swaps, caps and floors, swaptions, forward rate agreements, and cancelable swaps. To access the function type SWPM. This will bring up the SWPM Screen (Exhibit E.6-1) for creating and evaluating a generic interest rate swap. On this screen, you can fill in the amber areas with the details of the swap. In analyzing Swaps using SWPM Screen, you will find the market value of the swap displayed at the bottom. If you enter 0 for the spread, then the swap will be set up as a par value swap. By clicking on the bottom tabs, you can see the swap values, cash flows, interest rate risk, and a horizon analysis. The cash flows for the swap shown in Exhibit E.6-1 are displayed in Exhibit E.6-2.

Exhibit E.6-1: SWPM

<HELP> for explanation, <MENU> for similar functions. N108c Corp SWPM

De		Counterparty		Tick	/	Series	Deal #
Ticker	Series	Leg#					
Notional		Cpn	%			Notional	Index
Curr		Calc Basis				Curr	Index
Effective		Pay Freq				Effective	Spread
Maturity		Day Cnt				Maturity	Reset Freq
FirstPmt		Unwind Cpn	%			FirstPmt	Pay Freq
NxtLastP		Unwind Annuity	0.00000 %			NxtLastP	Day Cnt
Discount						Discount	USD Swaps(30/360, 5/Y)
ForwardC						ForwardC	USD Swaps(30/360, 5/Y)
Valuation							
Market Val	10,000,000.00		4,360.30			Market Val	-10,000,000.00
Accrued	0.00					Accrued	-0.00
Net Principal	0.00	Calculat				Par Cpn	5.13000
Accrued	0.00	Premiu				DVO	4,360.30
Market Valu	0.00	Unwind F0.00					

Main Curves Cashflow Risk Horizon

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Exhibit E.6-2: SWPM Cash Flow

<HELP> for explanation. N108c Corp SWPM

Deal	Counterparty	SWAP	CNTPARTY	Tick	/	SWAP	Series	Deal #
REC	FIXED	Coupon	5.13000			Frequency	5	Curr USD Notional 10
PAY	FLOAT	Latest Index	5.37688	+0.00	bp	Reset/Pmnt Freq	S/S	Curr USD Notional 10
Cashflow								
Payment Dates	Payments(Rcv)	Payments(Pay)	Net Payments	Discount	Net PV			
07/16/2007	256500.01	-270337.58	-13837.57	0.973678	-13473.34			
01/16/2008	256500.01	-263943.70	-7443.69	0.948639	-7061.38			
07/16/2008	256500.01	-253115.10	3384.90	0.925220	3131.78			
01/16/2009	256500.01	-247609.43	8890.57	0.902865	8026.98			
07/16/2009	256500.01	-251606.96	4893.04	0.880705	4308.33			
01/16/2010	260775.01	-258078.84	2696.07	0.858548	2314.71			
07/16/2010	252225.01	-245054.63	7170.38	0.838012	6008.66			
01/16/2011	259390.01	-245580.81	4768.10	0.817208	3897.34			
07/16/2011	256500.01	-258685.36	-2185.36	0.796601	-1740.66			
01/17/2012	1025075.01	-10262048.75	-6937.75	0.776259	-5413.43			
Total					0.00			

Main Curves Cashflow Risk Horizon

Australia 61 2 2977 8500 Brazil 5511 3248 4500 Europe 44 20 7930 7600 Germany 49 29 325410 Hong Kong 852 2377 6000 Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000 Copyright 2007 Bloomberg L.P. H04-668-0 11-Jan-2007 19:36:32

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To access other interest rate products on SWPM, you click ‘New Deal.’ This will bring down a menu of other interest rate derivatives. From the drop-down menu, you can click one of the other interest products (e.g., caps, floors, or collars). For example, to evaluate a Cap you would click “Cap” (this screen can also be accessed by typing BCCF). This brings up the following screen (Exhibit E.6-3) for evaluating a CAP using LIBOR:

Exhibit E.6-3: SWPM for a CAP

<HELP> for explanation. N108c Corp SWPM

Options		New Deal	Save Deal	View	SWAP MANAGER	
De	counterparty	Tick	/	Seri	Deal #	DETAIL
Type						DETAIL
Notional				Index	Percent	
Currency				Latest Inde	5.32226	Spread
Effective			X	Reset/Pay		bp
Maturity				Tenor	YR	MO
Cap Strike	%	Rcv	X	Cap Detail		Digital
Day Count				Discount C		USD Swaps (30/360, S/A)
Bus Day A				Forward Cu		USD Swaps (30/360, S/A)
				Vol Cu		USD Bloomberg Cube
Valuation	Curv			Valuatio		All Values USD
Market Value	213,733.99	Delta (Hedge)	0.57047	ATM Strike	5.00583	
Calculate		Gamma (10b)	0.03735	DV01	-2,270.61	
Premium		Vega (1%)	12,013.82	Yield Value	50.82	
Implied Volatility	17.24777	Theta (1-day)	-136.22			Refresh

Main Curves Valuation Hist. Cashflow
 Australia 61 2 3277 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 320410
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Other Swap Functions

Some of the other Bloomberg swap functions to note are

- **IRSM** displays a menu of functions for analyzing interest rate swaps.
- **USSW** provides data useful in analyzing and valuing swaps (e.g., LIBOR and futures markets information).
- **ASW** determines the relative value of a selected bond through the interest rate swap market.
- **FWCV** projects forward rates and interest rate swap curves
- **OVSW** values swaptions.
- **BCCF** creates and values interest rate caps, floors, and corridors.
- **SWPL** evaluates more complex swaps, such as callable and putable swaps.

Credit Derivatives

Bloomberg also provides a number of functions for accessing information and analytics on credit default swaps and other credit derivatives. The following functions are a good way to get started:

- **WCDS – Credit Default Swap Prices:** This function shows swap prices by company and industry.

Exhibit E.6-4: WCDS

<HELP> for explanation, <MENU> for similar functions. N299 Corp **WCDS**
 Enter # <GD> to view curve in CDS.

WORLD CDS PRICING Page 1/4

Source: CMA NY EOD Mid/Last Spreads (New York)

Select: Single Name CDS Sector: Energy
 Search: Corporate Ticker Currency: USD

Reference Name	Year	Spread	Abs	Chg	Time	3 Mon	YTD
1) Anadarko Petroleum C...	CAPCIU5	30.500	-1.000	01/11		-8.000	-4.750
2) Apache Corp	CAPA1U5	16.225	-0.105	01/11		-9.275	-1.875
3) Baker Hughes Inc	CBH1U5	22.700	-0.050	01/11		8.700	-0.800
4) Buckley Partners LP	CT374448	37.500	0.250	01/11		-14.500	-4.750
5) Cameron Internationa...	CT365348	30.500	-1.000	01/11		-4.500	0.000
6) Canadian Natural Res...	CT363132	34.500	-0.005	01/11		-9.000	-1.000
7) CenterPoint Energy R...	CT386580	32.420	0.170	01/11		-4.580	-0.580
8) Chesapeake Energy Co.	CCHK1U5	125.170	2.590	01/11		-9.330	10.170
9) ChevronTexaco Capita...	CT386456	5.710	-0.290	01/11		-1.290	0.210
10) China National Offsh...	CNCO1U5	12.000	0.000	01/11		-8.000	1.000
11) ConocoPhillips	CCOC1U5	15.095	-0.155	01/11		-7.405	-1.405
12) Devon Energy Corp	CDVNIU5	25.500	-0.060	01/11		-8.000	-2.340
13) Duke Capital LLC	CDUCC1U5	44.915	-1.085	01/11		10.415	14.415
14) Dynegy Holdings Inc	CDYNIU5	224.380	-0.370	01/11		-20.620	-3.120
15) El Paso Corp	CEP1U5	112.925	-1.240	01/11		-86.075	-7.075
16) EnCana Corp	CECA1U5	25.470	0.040	01/11		-10.530	-0.530
17) Enbridge Energy Part...	CT371444	32.500	-0.200	01/11		-12.500	-3.330
18) Enbridge Inc	CT357135	18.580	0.000	01/11		-8.420	-0.920

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- **CDSW – Credit Default Swap Calculator:** This function calculates swap values using two CDS valuation models: Hull-White Model and JP Morgan Model (See Exhibit E.6-5).

Exhibit E.6-5: CDSW

<HELP> for explanation, <MENU> for similar functions. N090 Corp **CDSW**
 1<GD> to save Deal, 2<GD> to save curve source

CREDIT DEFAULT SWAP CPU:122

Deal	Curve	View	Reference Obligation	BSVA Risk	Amortization
Deal Information RED Pair:					
Reference:	Counterparty:			Curve Date:	Term:
Ticker:	Series:	Privilege:	Deal#:	Benchmark:	Ask
Business Days:	USD	Settlement:	User	US BGN Swap Curve	Ask
Business Day Adj:	Following	Currency:	Code:	Spreads:	Defaults
BUY Notional:	10.00 MM	Amortizing:	USD	IMM	IMM
Effective Date:	1/12/07	Knock Out:	N	Par Cds Spreads	Default
Maturity Date:	1/12/12	Day Count:	ACT/360	Flat:	(bps) Prob
Payment Freq:	Quarterly	Month End:	N	6 mo	100.000 0.0083
Pay Accrued:	True	First Cpn:	4/12/07	1 yr	100.000 0.0167
Curve Recovery:	True	Next to Last Cpn:	10/12/11	2 yr	100.000 0.0331
Recovery Rate:	0.40	Date Gen Method:	Backward	3 yr	100.000 0.0492
Deal Spread:	100.000 bps	Debt Type:	Senior	4 yr	100.000 0.0650
Calculator Mode: Calc Price					
Valuation Date:	1/12/07	Model:	JPMorgan	5 yr	100.000 0.0806
Cash Settled On:	1/17/07	Repl Sprd:	100.000 bps	7 yr	100.000 0.1110
Price:	100.00000000	Days:	0	10 yr	100.000 0.1547
Principal:	0.00	Frequency:	Quarterly	Day Count:	ACT/360
Accrued:	0.00	Recovery Rate:	0.40		
Market Val:	0.00	IR DV01:	.00		

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- **ASW** calculates the asset swap spread and z-spread on a bond to aid in determining the swaps value. Enter Corporation's Ticker [CORP] to find page of the corporation's bonds. Select bond, and type ASW.
- **CDSN** calculates a basket of default swaps
- **CDSW** displays credit default swap spread curves

Convertible Bonds

Convertible bonds and functions for analyzing them can be accessed from the company's equity menu. For example, to access Duke Energy's convertible bonds:

- Enter DUK [EQUITY] <go>
- On the Duke Menu, click "Option, Warrants, and Convertibles"
- On the Options, Warrants, & Convertible Screen, click "Convertible Information Table"
- On the resulting Convertible Security Screen, move cursor to convertible bond of interest and click to bring up menu.
- On the Menu Screen, type DES to bring up the Description Screen on the Convertible (see Exhibit E.6-6).

Exhibit E.6-6: Convertible Bond Description

Backpage		P141 Corp DES																																																										
SECURITY DESCRIPTION		Page 1 / 3																																																										
DUKE ENERGY CORP DUK1 ¾ 05/23-07 99.313/99.313		(4.29/4.29) TRAC																																																										
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Once a convertible bond is loaded, a number of functions can be used to evaluate the security:

- **CBMU**: This function brings up the Convertible Bond Main Menu. On this screen, you can access all of Bloomberg's convertible bond functions.
- **CNVG**: This function graphs the convertible's corporate bond price and stock price.
- **OVCV**: This function determines the fair value of the convertible.

Mortgage-Backed Securities:

The following functions can help you get started on mortgage-backed and asset-backed securities:

1. To look up specific agency MBS:
 - FHLMC (Freddie Mac Securities): Enter **FHR** [MTGE] <go>
 - GNMA: **GNR** [MTGE] <go>
 - FNMA: **FNR** [MTGE] <go>
2. For an agency MBS finder, enter [MTGE] **MAX**
3. Useful MBS functions:
 - [MTGE] **CLAS** – Glossary of CMO Class Types
 - **YT** – Yield table
 - **CFG** – Cash Flow Graph
 - **WALG** – Weighted Average Life Graph
 - **CLC** – Collateral Composition
 - **CPH** - Historical prepayments
 - **CLC** – Collateral information
 - **VALL** displays a table of dealer prepayment assumptions
 - **PVG** shows chart of prepayment model available on Bloomberg
 - **DV** displays prepayment model based on your select scenarios
 - **YT** values a mortgage or asset-backed security given different assumptions.

E.7 OTHER USEFUL BLOOMBERG FUNCTIONS

Information and analytical functions on all of the derivatives examined in this text can be accessed from the Bloomberg system. Below are a number of other Bloomberg functions that can be used for evaluating derivatives, the derivative's underlying asset, or a portfolio.

1. **YAS** estimates interest rate risk and hedge ratios need to hedge selected securities.
2. **PSA** creates a report forecasting the portfolio performance based interest rate and exchange rate scenarios.
3. **PTED** calculates the spread between a corporate and government security and the corresponding Eurodollar futures strip for a selected portfolio.
4. **OPSF** takes portfolio created in PRTU and allows you to load a program with options and evaluate the portfolio for selected scenarios.
5. **VOL** compares historical volatilities with implied volatilities.
6. **HRH** displays a historical return histogram for a selected security.
7. **HVT** shows historical price or yield volatility for a selected security.
8. **FRD** calculates forward exchange rates.

9. **FWCV** projects forward interest rates and forward swaps rates.
10. **BTMM** monitors major rates and economic information for selected countries.
11. **WEIF** displays World Equity Index Futures.
12. **WBF** displays World Bond Futures.
13. **WIR** displays World Interest Rate Futures.
14. **GLCO** displays Global Commodity Prices. (The Commodity screen does not show futures exclusively, so be sure to select the correct security.)
15. **PSFX** creates and evaluates currency swap positions.
16. **IYC** displays information on yield curves for different countries.

BLOOMBERG DERIVATIVE EXERCISES USING BLOOMBERG

CHAPTER 1: OPTION CONCEPTS AND FUNDAMENTAL STRATEGIES

1. Select a stock of interest and identify the exchange-traded options traded on it.

Example: Options on IBM

- Enter IBM [EQUITY]
- On IBM Menu, click “Option, Warrants, and Convertibles”
- Click OMON

Alternative: Enter IBM [EQUITY] OMON

For a display example of the OMON Screen, see Exhibit E.2-1.

2. Examine the contracts traded on the Chicago Board of Trade.
 - Type CEM to bring up “Contract Exchange Menu”
 - On Contract Exchange Menu, click CBT

For display examples of the CEM and CBT Screens, see Exhibits E.4-15 and E.4-16.

3. Examine the contracts traded on the Chicago Board of Options Exchange
 - Type CEM to bring up “Contract Exchange Menu”
 - On Contract Exchange Menu, click CBO
4. Examine the contracts traded on the Chicago Mercantile Exchange
 - Type CEM to bring up “Contract Exchange Menu”
 - On Contract Exchange Menu, click CME

CHAPTER 2: THE OPTION MARKET

1. Determine the recent prices and option details on an exchange option on a particular stock.

Example: Information on options on IBM

- Enter IBM [EQUITY] OMON
- Set cursor on option of interest and left quick (use contract month key to see option by expiration)
- On resulting menu, access the following functions: DES, QRM, TSM, and GPO

For a display example of the IBM Description Screen, see Exhibit E.2-1.

2. Determine the most actively traded options on a particular stock.

Example: Enter IBM [EQUITY] OMST

For a display example of the OMST Screen for most actively traded options, see Exhibit E.2-9.

3. Determine the most actively traded stock options on a particular exchange.

Example: Most active stock options

- Press [EQUITY]
- Press Derivative
- Click MOSO function
- Alternative: Enter [EQUITY] MOSO

For a display example of the MOSO Screen, see Exhibit E.2-18.

4. Determine the recent prices and option details on an index.

Example: Information on options on the SP 100

- Enter: OEX [INDEX] OMON
- Set cursor on option of interest and left quick
- On resulting menu, access the following functions: DES, QRM, TSM, and GPO

5. Determine the most actively traded options on a particular index.

Example: Enter OEX [INDEX] OMST

6. Determine the recent prices and option details for exchange-traded options on a spot currency.

Example: British Pound

- Type CTM
- Click “Spot Currency Options”
- Click British Pound and OMON

For a display example of the OMON Screen for British Pound, see Exhibit E.3-5.

Example: British pound options on Philadelphia Exchange

- Type FCO and then select British Pound to bring up OMON screen on British Pound options traded on PHLX
- Set cursor on option of interest and left quick
- On resulting menu access the following functions: DES, QRM, TSM, and GPO

7. Determine the most actively traded PHLX options on a currency.

Example: PHLX British pound options

- Type FCO and then select British Pound to bring up OMON screen on British Pound options traded on PHLX
- Type OMST

CHAPTER 3: OPTION STRATEGIES

1. Select an exchange call and put option on a company and evaluate the following option strategies with a profit table and graph using the Bloomberg OSA function: call purchase, put purchase, straddle purchase, straddle sale, synthetic long position, or synthetic short position.

Example: Construct a profit table and graph for options on IBM

- Enter IBM [EQUITY] OSA; on the OSA screen enter stock position (if any) and then click “Add Options” to identify IBM options (remember the standard size on a stock option contract is 100 options)
- Input positions; after loading, type 1 and press <go>
- Click “Graph” to see position

For a display example of the OSA Screens for IBM, see Exhibits E.2-2 and E.2-3. For an example of the profit graph and table for a straddle purchase formed with IBM options, see Exhibits E.2-4.

2. Find the latest news and financial information about the stock you selected in Question 1.

Example: To access news and information on IBM:

- Enter IBM [EQUITY]
- From the menu, click the functions of interests

3. Select an exchange call and put option on an index and evaluate the following option strategies with a profit table and graph using the Bloomberg OSA function: call purchase, put purchase, straddle purchase, straddle sale, synthetic long position, or synthetic short position.

Example: Profit table and graph for options on S&P 500:

- Enter SPX [INDEX] OSA
- On the OSA screen enter index position (if any) and then click “Add Options” to identify S&P 500 options
- Input positions; after loading, type 1 and press <go>
- Click “Graph” to see position

4. Evaluate a portfolio insurance strategy using OSA. Assume your portfolio is correlated with the S&P 500 and select S&P 500 put option contracts expiring at or near the future date you want to evaluate your portfolio. In using OSA to construct a profit table, select positions on the index that best match the value for your portfolio (e.g., 1,000 for a portfolio worth 1,000 hypothetical shares of the index times the index value). In determining the number of put options on the S&P 500 needed to hedge your index portfolio, remember the S&P 500 spot options have a 100 multiplier.

- Enter SPX [INDEX] OSA
- On the OSA screen enter index position (e.g., 1000)
- Click “Add Options” to input put positions (10 puts (given 100 multiplier) with expiration near portfolio liquidation date

- After loading, type 1 and press <go>
- Click “Graph” to see position.
- Click “Graph” on Graph Screen to bring up a menu; select “Market Value”

CHAPTER 4: FUNDAMENTAL OPTION PRICE RELATIONS

1. Select several exchange-traded call and put options on a stock, currency or index from Bloomberg’s OMON. Given the option prices, determine if they satisfy some of the boundary conditions presented in Chapter 4. Note: The stock options that you select are likely to pay a dividend that needs to be incorporated in the boundary conditions. To avoid the complications of dividend payments, you may want to look for options that expire in the near term.

Example: IBM, enter IBM [EQUITY] OMON

CHAPTER 5: THE BINOMIAL OPTION PRICING MODEL

1. Estimate the binomial (trinomial) price of call and put options on a selected stock using the Bloomberg OV function. Examine the model’s call and put values and stock price curve generated from Bloomberg. In valuing your option, try to select an option on a stock that is not expected to go ex-dividend during the option’s expiration period. You may want to select an option with a short expiration period. Use either Bloomberg defaulted values for the stock’s volatility and risk-free rate or input your own.

Example: Binomial OPM values on IBM call and put options. To access and value options on IBM:

- Enter IBM [EQUITY] OMON
- Set cursor on option of interest (select near-term option) and left quick OV.
- On the OV screen, select Trinomial; on dividend screen, select discrete dividends and check to make sure the stock has no future dividend during the life of the option (if so select another one or set dividend to zero); on OV screen you can change the volatility or keep the defaulted one.
- Press <help> for information on the OV program’s defaults

For an example of the OV Screen for an IBM option using the trinomial model, see Exhibit E.2-7.

2. Using the ‘Binomial Option Pricing Model’ Excel Program, determine the price of the call and put on the stock given the information on the options provided by Bloomberg (make the number of subperiods at least 30). Compare your Excel BOPM value to the Bloomberg’s trinomial model value.
3. Using the Bloomberg historical volatility function (HVG), identify the historical volatility on the stock you selected in Question 1.

Example: To access options on IBM, enter IBM [EQUITY] OMON; type HVG.

For a display example of the HVG Screen, see Exhibit E.4-20.

4. Use Bloomberg's BTMM function to determine the risk-free rate for BOPM: Type BTMM.

CHAPTER 6: THE BINOMIAL PRICING OF OPTIONS ON DIVIDEND-PAYING STOCKS AND STOCK INDICES

1. Estimate the binomial (trinomial) price of call and put options on a selected stock expected to pay dividends using the Bloomberg OV function. Examine the model's call and put values and stock price curve generated from Bloomberg. Select an option with some time to expiration to ensure the stock will pay future dividends. Use either Bloomberg defaulted values for the stock's volatility, risk-free rate, and dividends or input your own.

Example: Binomial OPM Value on IBM call and put options. To access options on IBM:

- Enter IBM [EQUITY] OMON
- Set cursor on option of interest (select a longer term option) and left quick OV.
- On the OV screen, select Trinomial; on dividend screen, select discrete dividends; on OV screen you can change the volatility or keep the defaulted one (type help for information on program's defaults).

For an example of the OV Screen for an IBM option using the trinomial model, see Exhibit E.2-7.

2. Using the 'Known-Dividend Payment Binomial Model' Excel Program, determine the price of the call and put on the stock you selected in 1 given the information provided by Bloomberg on the options and the underlying stock's dividend payments and ex-dividend dates. Compare your Excel BOPM values to Bloomberg's trinomial model's values.
3. Estimate the binomial (trinomial) price of a call or put option on a stock index using the Bloomberg OV function. Examine the model's option value and stock price curve generated from Bloomberg. Use either Bloomberg's defaulted values for the stock's historical volatility, risk-free rate, and dividend yield or input your own.

Example: Binomial OPM Value on S&P 500 call and put. To access options on S&P 500:

- Enter SPX [INDEX] OMON
- Set cursor on option of interest and left quick OV
- On the OV screen, select Trinomial; on dividend screen, input dividend flow; on OV screen you can change the volatility or keep the defaulted one (type help for information on program's defaults).

For an example of the OV Screen for an S&P 500 spot index option using the trinomial model, see Exhibit E.3-3.

4. Using the Bloomberg historical volatility function, identify the historical volatility of the stock index you selected in Question 3.

Example: S&P 500, enter SPX [INDEX] OMON; type HVG.

CHAPTER 7: THE BINOMIAL PRICING OF OPTIONS ON CURRENCIES AND BONDS

1. Using the Binomial Model Excel Program, determine the prices of a call and put on an exchange-traded spot currency option. Find information on the options and BOPM inputs using Bloomberg: OMON to select option; DES to obtain information; HVG to find historical volatility; BTMM to find U.S. and foreign interest rate.

Example: Binomial OPM value of a British pound call or put option. To access PHLX options on the British pounds:

- Type FCO <go>
- Select British Pound to bring up OMON Screen.
- Set cursor on option of interest and left quick DES
- On DES Screen, you will find current price (Spot \$/BP), option exercise price, option expiration, and market price of the option.
- Type HVG to access graph and table of historical volatility
- Type BTMM to find U.S. rates and United Kingdom rates
- Input information in Binomial Model Excel Program to determine the binomial value of the option

CHAPTER 8: THE BLACK-SCHOLES OPTION PRICING MODEL

1. Estimate the Black-Scholes values of call and put options on a selected stock using the Bloomberg OV function. Examine the model's option value and stock price curve generated from Bloomberg's OV function. Examine the option's Greeks: delta, theta, gamma, vega and rho. Use either Bloomberg's defaulted values for the stock's historical volatility, risk-free rate, and dividend yield or input your own.

Example: Black-Scholes OPM values on IBM call and put. To access options on IBM:

- Enter IBM [EQUITY] OMON
- Set cursor on option of interest and left click OV
- On the OV screen, select Black-Scholes; on dividend screen, select dividend yield; on OV screen you can change the volatility or keep the defaulted one.

For a display example of the OV Screen valuing IBM options using the Black-Scholes model, see Exhibit E.2-6.

2. Using the Black-Scholes Excel Program, determine the price of the call and put options on the

stock you selected in Question 1 using the option information from Bloomberg's OV Screen on the options. Compare your Excel and Bloomberg B-S values.

- Using Bloomberg's SKEW function, examine the volatility smile on the stock you selected in Question 1 given different expirations. Identify the implied volatility that best relates to the option you selected in Question 1.

Example: Volatility Smile for IBM:

- Enter IBM [EQUITY] SKEW
- On SKEW Graph Screen, identify volatility with expiration and exercise price closest to the expiration and exercise price on the option you selected in question 1.

For a display example of the SKEW Screen for IBM, see Exhibit E.2-17.

- Estimate the Black-Scholes values of call and put options on an index using the Bloomberg OV function. Examine the option's Greeks: delta, theta, gamma, vega and rho. Use either Bloomberg's defaulted values for the index's historical volatility, U.S. risk-free rate, and dividend yield or input your own.

Example: B-S OPM values on S&P 500 call and put. To access options on S&P 500:

- Enter SPX [INDEX] OMON
- Set cursor on option of interest and left click OV
- On resulting menu click OV
- On the OV screen, select Black-Scholes; on dividend screen, select dividend yield; on OV screen you can change the volatility or keep the defaulted one (type help for information on program's defaults).

- Using Bloomberg's SKEW function, examine the volatility smile on the index you selected in Question 4 for different expirations. Identify the implied volatility that best relates to the index option you selected in Question 4.

Example: Volatility smile for S&P 500:

- Enter SPX [INDEX] SKEW
- On SKEW Graph Screen, identify volatility with expiration and exercise price closest to the expiration and exercise price on the option you selected in Question 4.

CHAPTER 9: EMPIRICAL TESTS, APPLICATIONS OF THE OPTION PRICING MODEL AND EXOTIC OPTIONS

- Select exchange call and put options on a stock and evaluate the following option strategies for different holding periods with a profit table and graph using the Bloomberg OSA function: call purchase, put purchase, straddle purchase, straddle sale, synthetic long position, or synthetic short position.

Example: Construct a profit table for options on IBM for different holding periods

- Enter IBM [EQUITY] OSA; on the OSA screen enter stock position (if any) and then click “Add Options” to identify IBM options
- Input positions; after loading, type 1 and press <go>
- Click “Graph” to see position.
- On graph select different evaluation dates (Eval Dates)
- Press <Help> for information on the OSA

For a display example of the OSA Screens for IBM, see Exhibits E.2-2 and E.2-3. For an example of the profit graph and table with different evaluation periods for a straddle purchase formed with IBM options, see Exhibits E.2-4.

2. Generate a profit graph and table for a calendar call or put spread using the Bloomberg OSA function.

Example: Construct a profit table for a calendar spread on IBM for different holding periods:

- Enter IBM [EQUITY] OSA
- On the OSA screen click “Add Options” to identify IBM options
- Select call (or put) options with different expirations
- After loading, type 1 and press <go>
- Click “Graph” to see position. On graph select different evaluation dates (Eval Dates)
- Press <Help> for information on the OSA

3. Using the Bloomberg OV function find the delta, theta, gamma, vega and rho values for call and put options on a selected stock. On the OV graph, examine the Greeks (delta, gamma, and vega) values for different stock prices. Use either Black-Scholes or the Trinomial model and either keep Bloomberg’s default values for the stock’s volatility, risk-free rate, and dividend yield (or dividends for Trinomial) or input your own.

Example: Black-Scholes Greek values on IBM call and put options. To access options on IBM:

- Enter IBM [EQUITY] OMON
- Set cursor on option of interest and left click.
- On resulting menu click OV. On the OV screen, select Black-Scholes; on dividend screen, select dividend yield or dividends; on OV screen you can change the volatility or keep the defaulted one.
- On the graph screen (page 2 on OV Screen), change Y-axis: option price, delta, gamma, and vega.

For a display example of the OSA Screen showing the Gamma Graph for IBM, see Exhibit E.2-8.

4. Using the Bloomberg Exotic Option Valuation function, OVX, find the values, Greeks, and other information for the following exotic options formed with a selected stock or index:

- Chooser Option
- Compound
- Binary option: Cash or nothing or asset or nothing
- Lookback
- Asian

Use Bloomberg defaulted values for the stock's historical volatility, risk-free rate, and dividend yield or input your own.

Example: Exotic option values for IBM options. To access options on IBM:

- Enter IBM [EQUITY] OMON
- On the OMON Screen, type OVX
- On the OVX Menu Screen, select exotic option: Chooser Option, Compound, Binary (Digital) option, Lookback, and Asian.

For a display example of the OVX Screen and the OVX Screen for a chooser option formed with IBM options, see Exhibit E.2-12.

CHAPTER 10: FUTURES AND FORWARD CONTRACTS

1. Find descriptions, recent prices, outstanding contracts, and other information on an exchange-traded commodity futures contract: agriculture and livestock, energy and environment, and metals and industrials.

Example: Wheat futures contract information:

- Type CTM to bring up "Contract Table Menu"
- Click WHET (Wheat)
- On Wheat screen, type the number of the contract of interest or move your cursor to that contract and click
- Click CT to bring up the "Contract Table" and type DES

For specific contract:

- On "Contract Table," set cursor on contract of interest and left click to bring up menu.
- Click "Contract Information" and then "Description"
- On Description Screen, click "Related Function": FHG (Futures History Graph) and EXS (expiration schedule)

Alternative: Type ticker or identifier with 'a' and [CMDTY]. For crude oil futures listed on the New York Mercantile Exchange (NYMEX):

- NGa [CMDTY]
- Click "Contract Information"
- Click Description

For a display example of the CTM Screen, see Exhibit E.4-1; for a display example of a wheat futures contracts on CBT, see E.4-9; for an example of the Description Screen for a specific

wheat futures contract, see Exhibit E.4-10.

2. Find descriptions, recent prices, outstanding contracts, and other information on different types of exchange-traded financial futures contracts.

Example: S&P 500 futures contract information:

- Type CTM to bring up “Contract Table Menu”
- Click “Equity Index” (24)
- On Equity Index Screen, page down to find the contract of interest and click
- Click CT to bring up the “Contract Table” and type DES

For specific contract:

- On “Contract Table,” set cursor on contract of interest and left click to bring up menu
- Click “Contract Information” and then “Description”
- On Description Screen, click “Related Function”: FHG (Futures History Graph), EXS (expiration schedule), and FVD (fair value detail)

Alternative: Type ticker or identifier with ‘a’ and press [INDEX]. For S&P 500 futures contracts:

- SPa [INDEX]
- Click “Contract Information” and then “Description”

For a display example of equity index futures contracts from CTM, see E.4-2; for a display example of S&P 500 futures contracts, see E.4-3; for an example of the Description Screen for a specific S&P 500 futures contract, see Exhibit E.4-4.

3. Find descriptions, recent prices, outstanding contracts, and other information on an exchange-traded interest rate futures contracts.

Example: Three-Month Eurodollar futures listed on the CME

- Type CTM to bring up “Contract Table Menu”
- Click INTR (Interest Rate)
- On INTR screen, page down to the contract of interest (EDA) and click
- Click CT to bring up the “Contract Table”
- On “Contract Table,” set cursor on contract of interest and left click to bring up menu
- Click “Contract Information” and “Description”

4. Find descriptions, recent prices, outstanding contracts, and other information on different types of exchange-traded currency futures contracts.

Example: British pound futures contract information:

- Type CTM to bring up “Contract Table Menu”
- Click CURR (18)
- On CURR Screen, page down to the contract of interest (British Pound) and click
- Click CT to bring up the “Contract Table” and type DES

For specific contract:

- On “Contract Table,” set cursor on contract of interest and left click to bring up menu.
- Click “Contract Information and then “Description”
- On Description Screen, click a function from “Related Functions”

Alternative: Type ticker or identifier with ‘a’ and [CMDTY]. For British pound:

- GBPa [CRNCY]
- Click “Contract Information and then “Description

5. Find recent bid and ask rates on spot and forward rates on specific currency.

Example: British pound futures spot and forward contracts bid and ask rates:

- Enter GBP [CRNCY] BBC

6. Find the number of T-bonds or T-notes that can delivered on a selected T-bond or T-note futures contract and identify the cheapest

Example: 5-year T-Note

- Type CTM to bring up “Contract Table Menu”
- Click BOND (16)
- On BOND screen, page down to find the contract of interest and then click (e.g., US Treasury Note, 5 Yr (FVA))
- Click CT to bring up the “Contract Table”
- On “Contract Table,” set cursor on contract of interest and left click to bring up menu
- Click “Contract Information” and then “Description”
- On description page, click DLV (Cheapest to Deliver)

Alternative: Type ticker or identifier with ‘a’ and [CMDTY]. For 5-year Treasury notes:

- FVa [CMDTY]
- Click “Contract Information” and then “Description”
- On Description Screen, click DLV from “Related Functions”

Alternative: Access futures exchange. For 5-year Treasury notes:

- Type CEM
- Click CBT (Chicago Board of Trade)
- Page down to find US Treasury Note, 5 Yr (FVA) and click
- Click CT
- Type DLV

For a display example of the DLV Screen showing cheapest to deliver bonds, see Exhibit E.4-23.

7. Examine the prices on global commodity prices; type GLCO.

CHAPTER 11: PRICING FUTURES AND FORWARD CONTRACTS

1. Using Bloomberg's FVD (Fair Value Detail) function, find the fair value and carrying cost value (Theo Value) on an exchange-traded stock index futures contract.

Example: S&P 500 futures contract information:

- Enter SPa [INDEX]
- Click "Contract Information" and then Description
- Click FVD under Related Functions

For a display example of the FVD Screen for S&P 500 futures contract, see Exhibit E.4-5.

2. Access Bloomberg information on a currency futures contracts and U.S. and foreign interest rates and then determine the equilibrium price on a currency futures contract using the interest rate parity model. Compare the equilibrium price to the market price.

Example: Equilibrium price of British pound

For information to calculate the interest rate parity value for a British pound futures contract:

- Type CTM to bring up "Contract Table Menu"
- Click CURR (18)
- On CURR screen, page down to the contract of interest (British Pound)) and click
- Click CT to bring up the "Contract Table" and type DES
- On "Contract Table," set cursor on contract of interest and left click to bring up menu:
- Click "Contract Information" and then "Description"
- Find current futures price, expiration (EXS), and current spot exchange rate (TKC).
- For country interest rates information, type BTMM

3. Access Bloomberg information on Eurodollar futures contracts and U.S. interest rates and then determine the equilibrium price on a Eurodollar futures contract using the carrying cost model. Compare the equilibrium price to the market price.

Example: Three-Month Eurodollar futures listed on the CME

For information:

- Type CTM to bring up "Contract Table Menu"
- Click INTR (Interest Rate)
- On INTR screen, page down to the contract of interest and click
- Click CT to bring up the "Contract Table"
- On "Contract Table," set cursor on contract of interest and left click to bring up menu
- Click "Contract Information" and "Description"
- On Description Screen (or Contract Table) find the futures' price and expiration
- For interest rate information (e.g., LIBOR), type BTMM

CHAPTER 12: OPTIONS ON FUTURES CONTRACTS

1. Find descriptions, recent prices, outstanding contracts, historical implied volatility, volatility smile, and other information on an exchange-traded commodity futures option contract: agriculture and livestock, energy and environment, and metals and industrials.

Example: Wheat futures option contract:

- Type CTM to bring up “Contract Table Menu”
- Click WHET (Wheat)
- On Wheat CTM screen, page down to the contract of interest and click
- Click OMON to bring up the “Option Contract Table”
- On “Option Contract Table,” set cursor on contract of interest and left click DES
- On Description Screen, click some of the functions from “Related Function” menu
- Type HVG for historical volatility
- Type SKEW for volatility smile.

Alternative: Type ticker or identifier with ‘a’, press [CMDTY], and type OMON. For crude oil:

- Enter: CLa [CMDTY] OMON
- On “Option Contract Table,” set cursor on contract of interest and left click DES

For a display example of the CTM Screen, see Exhibit E.4-1; for a display example of futures and futures option contracts on the Wheat CTM Screen, see Exhibit E.4-8; for example of Description Screen on a wheat futures option contract, see Exhibit E.4-11.

2. Find descriptions, recent prices, outstanding contracts, and other information on different types of exchange-traded financial futures contracts.

Example: S&P 500 futures option contract information:

- Type CTM to bring up “Contract Table Menu”
- Click “Equity Index” (24)
- On Equity Index Screen, page down to the contract of interest (SPA) and click
- Click OMON to bring up the “Options Contract Table”
- On “Option Contract Table,” set cursor on contract of interest and left click DES
- On Description Screen, click some of the functions from “Related Function” menu
- Type HVG for historical volatility
- Type SKEW for volatility smile

Alternative: Type ticker or identifier with ‘a’, press [INDEX], type OMON. For S&P 500 futures contracts:

- SPa [INDEX] OMON
- On “Option Contract Table,” set cursor on contract of interest and left click DES

For a display example of the CTM Screen, see Exhibit E.4-1; for a display example of futures and futures option contracts on Equity Index CTM Screen (futures options are in gray), see Exhibit E.4-3; for an example of HVG Volatility Graph on S&P 500, see Exhibit E.4-20; for an example of HIVG graph, see Exhibit E.4-21.

3. Find descriptions, recent prices, outstanding contracts, and other information on different types of exchange-traded currency futures contracts.

Example: British pound futures contract information:

- Type CTM to bring up “Contract Table Menu”
- Click CURR
- On CURR screen, page down to the contract of interest and click
- Click OMON to bring up the “Options Contract Table”
- On “Option Contract Table,” set cursor on contract of interest and left click DES
- On Description Screen, click some of the functions from “Related Function” menu
- Type SKEW for volatility smile

Alternative: Type ticker or identifier with ‘a’, press [CMDTY], type OMON. For British pound:

- GBP a [CRNCY] OMON
- Click contract of interest

4. Estimate the Black-Scholes Option Model values of call and put options on a commodity futures contract using the Bloomberg OV function. Examine the futures option’s Greeks: delta, theta, gamma, vega and rho. Use either Bloomberg defaulted model input values or input your own.

Example: Black-Scholes OPM values on wheat futures call and put options:

- Type CTM to bring up “Contract Table Menu”
- Click WHET (wheat)
- Click OMON to bring up the “Options Contract Table”
- On “Option Contract Table,” set cursor on contract of interest and left click OV to bring up option value screen

For a display example of the OV Screen for a wheat futures option, see Exhibit E.4-13.

5. Using the “Black Futures Option Excel Program”, determine the prices on call and put commodity futures options you selected in Question 4. Compare your Excel Black futures option values to the Bloomberg B-S values.
6. Using Bloomberg’s OV function, determine the values of the call and put options on a currency futures contract.

Example: OPM value of call and put options on British pound futures:

- Type CTM to bring up “Contract Table Menu”
- Click CURR
- Click OMON to bring up the “Options Contract Table”
- On “Option Contract Table,” set cursor on contract of interest and left click OV to bring up option value screen.

7. Using the “Black Futures Option Excel Program”, determine the prices on the call and put currency futures option contracts you selected in Question 6. Compare your Excel Black futures option values to the Bloomberg B-S values.

8. Select an exchange-traded futures and futures options on either a commodity or financial futures contract and evaluate the following futures and futures option strategies with a profit table and graph using the Bloomberg OSA function: call purchase, put purchase, straddle purchase, straddle sale, synthetic long position, or synthetic short position.

Example: To construct a profit table for S&P 500 futures and futures options:

- Type CTM to bring up “Contract Table Menu”
- Click “Equity Index”
- On Equity Index Screen, page down to contract of interest (S&P 500 futures, SPA) and click
- Click CT, Contract Table
- On CT Screen, type OSA
- On the OSA Screen enter futures position (if any) and then click “Add Options” to identify futures options
- Input futures option positions; after loading, type 1 and press <go>
- Click “Graph” to see position.

For a display example of the OSA Screen for S&P 500 futures, see Exhibit E.4-6.

CHAPTER 13: MANAGING EQUITY POSITIONS WITH STOCK INDEX DERIVATIVES

1. Using the HEDG function, calculate the number of futures contracts needed to hedge the systematic risk of a selected stock.

Example: IBM

- Enter: IBM [EQUITY] HEDG

For a display example of the HEDG Screen for IBM, see Exhibit E.4-25.

2. Set up an equity portfolio consisting of at least four stocks using PRTU. Given the portfolio’s market value and average beta, determine the number of S&P 500 futures contracts needed to hedge the portfolio’s position at a specified future date (select a futures contract expiring closest to that date).

Example: Construct Energy Stock Portfolio (see Section E.5) and determine the number of S&P 500 futures contracts needed to hedge the portfolio.

To construct portfolio:

- Type PRTU
- On PRTU Screen, click “Create New” button
- Input information
- Hit Menu
- Type PER and 1 <go>

- Type RPT
- From RPT Screen, find portfolio beta and market value
- For other information on your portfolio, type PMEN to access a menu of functions

For display examples of the PRTU and RPT Screens for forming the Energy Stock Portfolio, see Exhibits E.5-1 and E.5-2. Note: On the RPT Screen, the Energy Stock Portfolio Value is \$291,070 and the portfolio's Beta is 1.27

To access information on S&P 500 futures:

- Enter SPa [INDEX] CT
- Click contract with expiration closest to specified futures date

Use price sensitivity model, to determine number of futures contracts.

3. For the stocks in the equity portfolio you formed using PRTU in Question 2, construct and evaluate put-insured positions on some of the stocks in your portfolio using OPSA/OSA function.

Example: Construct Energy Stock Portfolio (See Section E.5).

- Type PRTU
- On PRTU Screen, click the name of the portfolio you constructed in Question 2.
- Type PMEN to access menu of functions and click "Equity Analytics"
- On the Equity Analytics Screen, access the option scenario screen (OPSA/OSA)
- On the OSA Screen, press amber "Source" key and then "Portfolio" to find your portfolio in PRTU, and then click your portfolio
- Click "Add Options" to input option positions for selected stocks
- Click "Graph" to see profit table and graph for each hedged stock position

For display examples of the OPSA Screen and profit table on the Energy Stock Portfolio, see Exhibits E.5-4 and E.5-5.

CHAPTER 14: MANAGING FOREIGN CURRENCY POSITIONS WITH DERIVATIVES

1. Examine current spot, forward, and cross exchange rates for 11 key currencies using Bloomberg's FXC function.

Example: Enter [CRNCY] FXC

For display example of the FXC Screen, see Exhibit E.4-27.

2. Find the current spot and forward rates on a selected currency using Bloomberg's BQ function:

Example: For British pound, enter GBP [CRNCY] BQ

For display example of the BQ Screen, see Exhibit E.4-28.

CHAPTER 15: MANAGING FIXED-INCOME POSITIONS WITH INTEREST-RATE DERIVATIVES

1. Find descriptions, recent prices, outstanding contracts, and other information on different types of exchange-traded interest rate futures and futures option contracts.

Example: T-Bond futures and futures option contracts

- Type CTM to bring up “Contract Table Menu”
- Click “BOND”
- On Bond Screen, page down to the contract of interest and click
- Click CT to bring up the futures contracts and OMON to bring up the “Options Contract Table”
- On option table or contract table, set cursor on contract of interest and left click to bring up menu
- Click “Contract Information” and then “Description”
- On Description Screen, click some of the function from “Related Function” menu.
- For T-Bond or T-Note contracts, click DLV to find cheapest to deliver bond
- Type HIVG for historical implied volatility
- Type SKEW for volatility smile

For a display example of the CTM Screen, see Exhibit E.4-1; for an example of a Description Screen for a T-Bond futures contract, see E.4-18; for an example of HIVG graph, see Exhibit E.4-21; for an example of DLV Screen, see Exhibit E.4-23.

2. Select an exchange-traded futures and futures option on a T-bond or T-note and evaluate the following futures option strategies with a profit table and graph using the Bloomberg OSA function: call purchase, put purchase, straddle purchase, straddle sale, synthetic long position, or synthetic short position.

Example: To construct a profit table for T-note futures and futures options:

- Type CTM to bring up “Contract Table Menu”
- Click “Bond”
- On Bond Index Screen, page down to the contract of interest and click (e.g., 5-year T-note, FVA)
- Click CT
- Type OSA
- On the OSA screen enter futures position (if any) and then click “Add Options” to identify futures options
- Input positions; after loading, type 1 and press <go>
- Click “Graph” to see position

3. Select an exchange-traded futures and futures option on an interest rate contract and evaluate the following futures option strategies with a profit table and graph using the Bloomberg OSA function: call purchase, put purchase, straddle purchase, straddle sale, synthetic long position, or synthetic short position.

Example: To construct a profit table for Eurodollar futures and futures options:

- Type CTM to bring up “Contract Table Menu”
- Click “Interest Rate”
- On Interest Rate Screen, page down to the contract of interest and click (e.g., Eurodollar, three month, CME)
- Click CT
- Type OSA
- On the OSA screen enter futures position (if any) and then click “Add Options” to identify futures options
- Input positions; after loading, type 1 and press <go>
- Click “Graph” to see position

4. Using the FYH function, determine the number of futures contracts needed to hedge a fixed income security.

Example: Hedge IBM bond with 7.5% coupon and maturing 6/15/13

- Enter IBM [CORP]
- Click 7.5% IBM bond maturing 1/15/13
- Type FYH

For a display example of FYH Screen for hedging the IBM 7.5% bond, see Exhibit E.4-26.

5. Examine the global market for interest rate and bond futures contracts.

Example: For world bond futures, type WBF

Example: For world interest rate futures, type WIR

CHAPTER 16: MANAGING FIXED-INCOME POSITIONS WITH OTC DERIVATIVES

1. Using Bloomberg’s SWPM function, form and evaluate a cap, floor, and collar.
 - Type SWPM
 - Click “New Deal” for menu
 - On drop-down menu, click interest rate derivative to evaluate: cap, floor, or collar

Alternative: Type BCCF

For a display example of SWPM Screen for evaluating a Cap, see Exhibit E.6-3.

2. Using Bloomberg’s USSW function, examine some of the current information and market data on futures and LIBORs that a bank would consider in forming a cap, floor, or collar.

Type USSW

CHAPTER 17: INTEREST RATE SWAPS

1. Using Bloomberg's SWPM function, form and evaluate a generic interest rate swap.

- Type SWPM

For a display example of SWPM Screen for a generic interest rate swap, see Exhibit E.6-1.

2. Using Bloomberg's IRSM function, examine some of the Bloomberg functions for analyzing interest rate swaps.

- Type IRSM

3. Using Bloomberg's ASW function, determine the relative value of a selected bond through the interest rate swap market.

- Load bond: Enter IBM [CORP]
- Click 7.5% IBM bond maturing 1/15/13
- Type ASW

CHAPTER 18: SWAP DERIVATIVES: FORWARD SWAPS AND SWAPTIONS

1. Using Bloomberg's FWCV function, evaluate projected forward rates, interest rate swap curves, and other information needed to value forward swaps and swaptions.

- Type FWCV

2. Using Bloomberg's SWPM function evaluate a cancelable swap.

- Type SWPM
- Click "New Deal" for menu.

3. Examine Bloomberg's SWPL function for evaluating more complex swaps.

CHAPTER 19: SWAP VALUATION

1. Examine Bloomberg's OVSW function for valuing a swaption.

- Type OVSW

CHAPTER 20: CURRENCY AND CREDIT SWAPS

1. Examine some of the following Bloomberg functions related to evaluating and obtaining information on currency swaps:
 - PSFX for creating currency swaps
 - IYC for obtaining information on yield curves for different countries
2. Using Bloomberg's WCDS function, examine the swap prices for different companies.
 - Type WCDS
3. Using Bloomberg's ASW function, determine the Z spread on a corporate bond to determine the company's CDS value.
 - Load bond: Enter IBM [CORP]
 - Click 7.5% IBM bond maturing 1/15/13
 - Type ASW

CHAPTER 21: EMBEDDED OPTIONS

1. Select a company of interest and identify the outstanding warrants issued by the corporation. Access information and determine the option pricing model values and Greeks on one of the company's outstanding warrants.

Example: Warrants on IBM

- Enter IBM [EQUITY] <go>
- On IBM Menu, click "Option, Warrants, and Convertibles"
- On Options, Warrants, & Convertible Screen, click WCM
- On WCM Screen, move cursor to warrant of interest and click to bring up menu
- On Menu Screen, type DES
- On Description Screen, click OV

For display examples of Description Screen and OV Screen for an IBM warrant, see Exhibit E.2-16 and E.2-17.

2. Select a company of interest and identify the outstanding convertible bonds issued by the corporation. Access information on one of the company's outstanding convertibles.

Example: Duke Energy convertible bonds

- Enter DUK [EQUITY]
- On Duke Menu, click "Option, Warrants, and Convertibles"
- On Options, Warrants, & Convertible Screen, click Convertible Bond Information Table
- On resulting Convertible Security Table, move cursor to convertible bond of interest and click to bring up menu.

- On Menu, type DES

For display example of Description Screen for a Duke convertible, see Exhibit E.6-6.

3. Analyze the convertible bond you selected in Question 2 using the following Bloomberg functions:
 - a. CNVG to graph the convertible's underlying bond and stock price
 - b. OVCV to determine fair value of the convertible.

CHAPTER 22: MORTGAGE- AND ASSET-BACKED SECURITIES AND THEIR DERIVATIVES

1. Select an agency MBS of interest (e.g., FHLMC, FNMA, or GNMA).
 - For FHLMC: Enter FHR [MTGE] <go>
 - For GNMA: Enter GNR [MTGE] <go>
 - For FNMA: Enter FNR [MTGE] <go>
2. Analyze the MBS you selected in Question 1 using the following Bloomberg functions:
 - CFG for a Cash flow analysis
 - WALG for determining the Weighted Average Life
 - CLC for Collateral Information
 - CPH for Historical prepayments
 - PVG to see a chart of prepayment models available on Bloomberg

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