

## **BLOOMBERG DERIVATIVE EXERCISES**

### **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

### **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

## 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

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”

## **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

## **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
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.

## **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).
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.

## **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

## **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.

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.
3. 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.
4. 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).
5. 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.

## **EMPIRICAL TESTS, APPLICATIONS OF THE OPTION PRICING MODEL AND EXOTIC OPTIONS**

1. 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.

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.

## **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

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"

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

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

## **PRCING 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

## 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

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

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:

- GBPa [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

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.

## **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

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

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

## **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

## **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
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

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

## **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

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

## **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

## **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.

## **SWAP VALUATION**

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

- Type OVSW

## 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

## 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

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

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.

## **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