

Individual assignment



**ASSIGN
BUSTER**

The software we will be using is called 'Derivative', which has been specifically developed for the Hull et al (2014) textbook. You can download the software from the Model unit site under the 'Additional Resources' section. Software Installation Instructions for the Derivative software are quite straight forward. Please follow these simple steps. Step 1. Go to the BIFF Model site, under 'Additional Resources' Section, click on the Derivative software and download the file 'Derivative.Zip'. Step 2. Double-click on the Derivative.Zip file to bring up the Winzip utility program. Step 3. In the Winzip utility program, on the 'Home' tab, there should be a button labeled '1-Click Unzip'. Press on the '1-Click Unzip' button. The compressed files directories and folders should then be extracted. Once Winzip has completed the extraction, then close the Winzip program. Step 4. There should now be a folder in your directory named 'Derivative'. Drill down through the Derivative folder until you come to the list of files; The only file you need to be concerned with for the Assignment is 'EDGES.XSL'. Step 5. Double-click on file 'EDGES.XSL'. This should bring up your Excel application program with the EDGES.L's spreadsheet. If you look in the 'readmes.Txt' file that is located in the same directory as the EDGES.XSL file, it will tell you the versions of the Excel program that Derivative will work with. If you are not using any of these versions of Excel then you will need to get access to one of them in order to do the assignment. Step 6. Once you have opened the 'EDGES.XSL' program in Excel, that final step you need to perform is to ensure that Excel has 'Enabled Macros'.

This will allow the Excel program to use the Visual Basic for Applications (ABA) code on which Derivative is based. If you are using Excel 2010, the

enable macros should appear as a 'strip' across the top of your spreadsheet when you first enter the EDGES . XSL program. You just need to press the enable button. If you a later version of Excel you will need to go to the macro security settings and enable the macros. Once you have enabled the macros, Derivative will be available for use. Step 7: Click on the Excel spreadsheet tab 'Equity_FIX_lender_Futures_Options'.

This is the only spreadsheet you will need to complete the assignment.

Format of Assignment and submission requirements: The assignment consists of seven questions. You should attempt all questions. Responses to the questions should be presented according to the Q Manual. The Q Manual provides guidelines on the presentation of submitted materials. Submission of the assignment will require both an electronic submission AND a hard copy submission: The submission of an electronic copy can be done via Model (further technical details will be provided prior to the submission date. The submission of a physical hard copy will be done via a designated assignment box located in the 3rd Floor Foyer of Building H. (further details to be provided closer to the submission date.) ASSIGNMENT QUA SECTIONS

Please note: Most, but not all of the material needed to answer these questions will be covered in lectures. You are postgraduate students so it is expected that you will be able to seek out the material necessary to complete the questions using your own initiative. All information is available within the textbook, even though it may not all be covered in lectures.

IQ . Use Derivative to calculate the value of an American put option on a non- dividend-paying stock when the stock price is USED 30, the strike price is USED 32, the risk-free rate is 5%, the volatility is 30% and the time to

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maturity is 1. Years. (Choose ‘ Binomial American’ for the option type and 50 time steps.) (See Chapter 9 for supporting theory and materials) a) What is the option’s intrinsic value? B) What is the option’s time value? C) What would a time value of zero indicate? What is the value of an option with zero time value?) Using a trial and error approach, calculate how low the stock price would have to be for the time value of the option to be zero. (use 50 and 500 time steps) Q. Consider an option on a stock when the stock price is \$41, the strike price is \$40, the risk-free rate is 6%, the volatility is 35% and the time to maturity is one year. Assume that a dividend of \$0.50 is expected after six months. (See Chapter 10 for supporting theory and materials) a) Use Derivative to value the option assuming it is a European call. B) Use Derivative to value the option assuming it is a European put.) Verify that put-call parity holds. D) Explore, using Derivative, what happens to the price of the options as the time to maturity becomes very large. For this purpose, assume there are no dividends. Explain the results you get. Q. Suppose that the price of a non-dividend-paying stock is \$32, its volatility is 0% and the risk-free rate for all maturities is 5% per annum. Use Derivative to calculate the cost of setting up the following positions. In each case provide a table showing the relationship between profit and final stock price. Ignore the impact of discounting.