FINC 623/ECON623
Homework Assignment—Plain Vanilla and Barrier Options

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Maximum team size: 3 persons

Consider two options that are alike, except that one is a plain vanilla call and the other is a knock-out call.

Assume the following input values:

Current price of ABC	\$80.00
Exercise Price	\$90.00
Standard Deviation of ABC	0.27
Days to Expiration	322
Risk-free rate (continuous compounding)	6.00%
Knock-Out Price	\$110

Assignment:

1. Using the OPTION! Software, determine the value of the knockout option. Capture and present a "screen shot" of the software window showing the correct solution.

2. In EXCEL, create a spreadsheet to price these two options with 12-period lattices. (Start with the Plain Vanilla and Barrier Options template on the course web site.) Construct the lattice to work with the provided starting point. (So your spreadsheet should allow you to change the input values and automatically re-compute the new option values.) Create two lattices, one for the stock price and a corresponding one for the plain vanilla option valuation. Arrange the two lattices such that the initial stock price occupies cell B22 and the current plain vanilla call price appears in cell B51. Therefore, the highest terminal stock price will fall in cell N10 and the lowest will be in N34. Arrange the other lattices to match given the starting points specified here.

3. Create a third corresponding lattice to price the barrier option, with the ultimate option price appearing in cell B77.

Submission:

1. The screen shot from assignment part #1
2. The following information regarding the spreadsheet lattice.
    - Maximum stock price attainable
    - Minimum stock price attainable
    - Plain vanilla call price
    - Knock-out call price

B. Two completed tables of the following form:

Standard Deviation	Plain Vanilla Price From the Lattice	Knock-Out Option Price From OPTION!	Knock-Out Option Price From the Lattice
0.1			
0.2			
0.27			
0.3			
0.4			
0.5			

Knock-Out Price (constant standard deviation = 0.27)	Knock-Out Option Price From OPTION!	Knock-Out Option Price From the Lattice
$100		
110		
120		
130		
140		
150		
160		
170		
180		
190		
200		

Note: It just might happen that the correct binomial price could be pretty far from the Black-Scholes price given by OPTION!