**Fordham University**

**Gabelli School of Business**

**QFGB-8925: Simulation Applications**

ASSIGNMENT 3: DUE: In 1-week

Submission requirement: one file that is the R Notebook version (Rmd file) of the program used to evaluate the returns to the strategy. Include your results and discussion of results in the rmd file. Upload to drop box on Blackboard.

Portfolio Strategies – Rolling Protective Put

Consider the rolling protective put strategy in class. Simulate the returns to the strategy over an investment horizon of one year.

Simulation parameters are as follows: Discretize using the log-normal approximation using a monthly grid over one year. Simulate for two different levels of drift (8% and 12%) and for two different levels of volatility (20% and 30%). Please confirm that your discretization is a good approximation of stock returns.

Option parameters are as follows: The strategy uses 3-month options rolled over every month, i.e. you will buy a three-month option and sell it at the end of one month when the option has two-months remaining for expiration. The strike price is always a constant proportion of stock price. Simulate for two different levels of the strike: 5% in-the-money and 5% out-of-the-money. Use the Black-Scholes model to calculate the value of the options. Assume that the risk free rate is 2%.

In calculating returns, assume that the initial investment is equal to the initial value of the stock. The purchase of puts will be financed by borrowing at the risk-free rate. Any excess cash received from puts will also be invested at the risk free rate.

Presents your results in a table. Evaluate your simulations. Describe how you can use your results to evaluate the tradeoffs of the protective-put strategy.

BONUS: Evaluate alternate strike price strategies, other than a constant proportion of stock price.