

## HOMework 5 7

1. The objective of this homework is to implement the string model described in class. The file `corrin.` has a 20 by 20 matrix of correlations among the first 20 discount bond prices (ignore the first discount bond price which is assumed to be non-stochastic). The file `corchol.` has the Cholesky decomposition of the correlation matrix. Use `pfilea.` again as the input discount function. The volatility function is in the file `sigma.` Simulate the evolution of the string of discount bond prices out to 10 years as in the example presented in class.
2. Given the initial term structure, solve for the forward par rates for 1, 2, 3, 4, and 5 year semiannual coupon bonds 5 years forward. By construction, each of these bonds has a current forward price of 100.
3. Now use the string model to solve for the futures price of a contract expiring in 5 years, where any of these bonds (with coupon rates equal to the forward par rates solved for in the last question) are deliverable at the expiration of the contract (conversion factor is 1.000 for all five bonds). Note that the short has the option of which bond to deliver. How much is the delivery option worth?