Francis Lin – 904025249 / hlin465 – IsyE 6767 AS2 - Report

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Problem 1
Bond Information:
Bond(11/19/2035, 0.5, 0.07)


Problem 2
Bond Price (r=7%, 10y): 103.145
Bond price with flat rate (4%): 106.981


Problem 3
Forward Times: 1.4137 2.4137 3.4137 4.4137 5.41644
Forward Prices: 122.077 117.254 111.353 106.435 102.5
Average Price (2016-2020): 111.924
Discount Rate (approx): 0.004419
Present Value: 109.277
Investment Cost: 98
Good Investment!
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- **Problem 1**: The first few lines display the bond pricing results, including the default bond and the semi-annual coupon bond.
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- **Problem 2**: The next section shows the unit tests of the pricing method in the Bond class. One test case uses a semi-annual bond with maturity T=4.2, frequency 0.5, coupon rate 8%, and flat interest rate 7%. The expected price is 103.1449377, and the calculated price matches within the tolerance level, confirming the correctness of the implementation.
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- **Problem 3**: The last section presents the results for calculating the price of the derivative security. After computing the bond forward price in each year, we take the arithmetic average of the 10-year bond forward prices. Finally, the last line displays the derivative security price, which is higher than the initial cost of the security, indicating that it is a profitable investment.