Bootstrapping

What is the price of a 1-year coupon bond paying 4%? Quarterly?

Here are some of the initial inputs:

- Face Value = 100
- Coupon = 4%
- Price of bonds with maturities 0.25, 0.5, 0.75, 1

Maturity (years)	Coupon	Price
0.25	Zero coupon	99.2
0.5	3.00%	100.5485
0.75	6%	103.1655
1	5%	103.0325

Step 1: With the bond prices, you are able to create discount factors for your 1-year bond with quarterly coupons.

*To calculate discounts

Z(0,0.25)	(99.2/100)
Z(0,0.5)	(100.5485- (3.00%/4*100*SUM (99.2:99.2)))/(100*(1+3.00%/4))
Z(0,0.75)	(103.1655- (6.00%/4*100*SUM (99.2:0.9906)))/100*(1+6.00%/4))
Z(0,1)	(103.0325- (5.00%/2*100*SUM (99.2:0.9871)))/100*(1+5.00%/2))

This will give you the appropriate discounts that you can use to bootstrap to create your 1-year coupon bond, quarterly.

Step 2: To find the price of a 1-year coupon bond paying 4% quarterly, it is the sum of the discounted cash flows (the coupon payments) and the discounted value of the face value you receive at maturity t=1.

Maturity	Coupon	Discount	Discounted CF
0.25	1	0.992000	0.992
0.5	1	0.990615	0.990615385
0.75	1	0.987109	0.987109132
1	101	0.932763	94.20904448
		Price	**97.178769**

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Options: Detailed Guide

Call Options

- **Long call:** We are in the position to buy the option to buy in the future at strike price
    - We are buying the option to buy the asset at strike price x
    - If the stock fails to meet the strike price before the expiration date, the option expires and becomes worthless. Selling an option is like writing an option
    - In the long call, you Pay $5 to begin with, then if it hits the strike price it is imitated. The strike price gives you zero profit, as it is a hedging opportunity. But if the price is increased, you can sell it at a higher price
- **Short call:** we are selling/shorting the option to buy asset x at strike price y. We think that the price will remain low. The higher the price after the strike price, the more we lose.

Put Options

- Give the holder the right to sell an underlying asset at a specified price
- **Long put:** either speculative buyers looking for leverage or "insurance" buyers who want to protect their long positions in a stock for the period of time covered by the option
- **Short put:** expecting the market to move upward (or at least stay stable)
- If you're longing a put, it means that you are going to be buying the option to sell the asset. You think that the price of the underlying security will go low. So, if you buy the put option to sell at strike price x, you can sell it for higher later.
- If you're shorting a put, it means that you're going to be selling the option to sell the underlying asset at x. You think that the asset price will increase.
- An obligation to buy the underlying security at the strike price if the option is exercised. The put option writer is paid a premium for taking on the risk associated with the obligation

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