Problem 1

Thursday, October 17, 2024 8:39 PM

a)

Part 1a	
Notional Value	$1,000.00
Annual Coupon rate	8%
Issued years ago	3.5
Matuarity	5.5
Risk free rate	4.50%

Chash Flow		
Year	Cash	PV
0.5	80	78.25856
1.5	80	74.88857
2.5	80	71.66371
3.5	80	68.57771
4.5	80	65.6246
5.5	1080	847.7819
Total Value	$1,206.80	

Part 1a		
Notional Value	1000	
Annual Coupon rate	0.08	
Issued years ago	3.5	
Matuarity	5.5	
Risk free rate	0.045	

Chash Flow		
Year	Cash	PV
0.5	=D5*D6	= D15/((1+$D$9)^C15
1.5	=D5*D6	= D16/((1+$D$9)^C16
2.5	=D5*D6	= D17/((1+$D$9)^C17
3.5	=D5*D6	= D18/((1+$D$9)^C18
4.5	=D5*D6	= D19/((1+$D$9)^C19
5.5	=D5*D6 + D5	= D20/((1+$D$9)^C20
Total Value	=SUM(E15:E20)	

The present value of the bond is $1206.80

b) Used python to solve equation for r

$$1028.50 = \sum_{t} \frac{P_t}{(1+r)^t}$$

```python
from scipy.optimize import fsolve

def bond_price_equation(r):
    price = 1028.50
    cash_flows = [80, 80, 80, 80, 80, 1080]
    times = [0.5, 1.5, 2.5, 3.5, 4.5, 5.5]

    # Calculate the sum of the discounted cash flows
    discounted_cash_flows = sum(cash_flow / (1 + r) ** time for cash_flow, time in zip(cash_flows, times))
    return discounted_cash_flows - price

# Use fsolve to find the value of r (the internal yield of return)
initial_guess = 0.05
ytm_solution = fsolve(bond_price_equation, initial_guess)

print(ytm_solution[0] * 100 ) # Return YTM as a percentage
```

The internal yeild of octurn is 8.25 %

c) The finacial has decreased as the bond is trading below the present value. The market has priced in additonal risk in the company