Valuation of Fixed-Income Securities

1. The following prices are given for risk-free zero coupon bonds of €1,000 face value with different maturities:

Bond	Maturity	Price
A	1 year	€934.58
B	2 years	€857.34
C	3 years	€772.18

a. Determine the market discount rate for one, two and three-year cash flows:

1 year ………………………………………………………………..

2 years …………………………………………………………………

3 years …………………………………………………………………

Answer:
Determine the <u>current market discount rate</u> for one, two and three years:

Year 1:	**$(€1{,}000 / €934.58)^{1}$ -1 x 100%**	**= 7%**
Year 2:	**$(€1{,}000 / €857.34)^{0.5}$ -1 x 100%**	**= 8%**
Year 3:	**$(€1{,}000 / €772.18)^{0.33}$ -1 x 100%**	**= 9%**

b. Computing the value of a coupon bond.

A risk-free 5% coupon bond has a remaining maturity of three years, just having paid its annual interest. Based on the market discount rates determined above, what is its current value?

PV of interest year	1	…………………………………	
,, ,,	2	…………………………………	
,, ,,	3	…………………………………	
Redemption		…………………………………	
Total			……………

Answer:
Compute the current value of the bond:

Interest year 1:	**€50 / 1.07**	**= €46.73**
Interest year 2:	**€50 / 1.08^2**	**= €42.87**
Interest year 3:	**€50 / 1.09^3**	**= €38.61**
Redemption :	**€1,000 / 1.09^3**	**= €772.18**
Current value		**= €900.39**
Par value		**= €1,000.00**

c. Is this a par, premium or discount bond value? Motivate your answer.

Answer:
Discount bond!

d. Compute the current yield (a rather old-fashioned concept, but frequently used in practice).

Answer:
€50 (coupon rate) / €900.39 (market value) = (x100%) 5.55%

e. Now state the general relationship between coupon rate and current yield:

1) Par bonds:
2) Discount bonds:
3) Premium bonds:

Answer:
Relationship between coupon rate, and current yield:

- **Par bonds (bonds with a market value equal at face value):**
  coupon rate = current yield

- **Discount bonds (bonds with a market value below par)**
  Current yield 5.55% > coupon rate 5%

- **Premium bonds (bonds with a market value above par)**
  Current yield < coupon rate

f. If a bond isn't risk-free, what consequence will this have for the coupon rate and/or the price?

Answer:
The bond price will be lower and/or the coupon is higher to compensate for the risk.

g. What is a rating agency? or AAA/Aaa bonds? or junk bonds?

Answer:
A *credit rating agency* is a company that assigns credit ratings for issuers of certain types of debt obligations as well as the debt instruments themselves.

***AAA/Aaa bonds* who are thought to have virtually no risk of default.**

***Junk bonds* are below investment-grade bonds that provide high yield with high risk.**

h. What is the risk, the holder of a "risk free" bond still will bear?

Answer:
Market risk.

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