SOME BOND BASICS

To illustrate:

- **Accrued interest**

- **Bond pricing**

- **Bond yield calculations**

Ultimately to ask:

- **Why is the yield on the Pagenet bond so much higher than that of the GE bond?**

PAGENET BOND

DG26 **Corp**   Y A

Y I E L D   A N A L Y S I S   CUSIP: 695542AB

PAGING NETWORK   PAGE 8 $^7_8$ 02/06   95.7779/ 96.7779 (9.61 /43) BGN MATRIX

P R I C E   96.777949   **S E T T L E M E N T   D A T E   8/ 4/1997**

current yield 9.170 See <Help> WORST   **C A S H F L O W   A N A L Y S I S**

Y I E L D	MATURITY 2/ 1/2006	
C A L C U L A T I O N S 2/ 1/ 6 @100.000		
STREET CONVENTION	9.435	9.435
U.S. GOVT EQUIVALENT	9.434	9.434
COMPUCORP/MONROE(TM)	9.435	9.435
TRUE YIELD	9.433	9.433
EQUIVALENT 1/YR COMPOUND	9.657	9.657
JAPAN INTEREST (CSIMPLE)	9.562	9.562
PROCEEDS/MMKT (ACT/360)		
A F T E R T A X :		
INCOME 39.60% CAPITAL 28.00%	5.726*	5.726*

ISSUE PRICE = 100.000. NON OID BOND WITH MKT DISCOUNT

S E N S I T I V I T Y A N A L Y S I S		
CNV DURATION (YEARS)	6.090	6.090
ADJ/MOD DURATION	5.816	5.816
RISK	5.633	5.633
CONVEXITY	0.441	0.441
PRICE VALUE OF A 0.01	0.05633	0.05633
YIELD VALUE OF A 1/32	0.00555	0.00555

TO 2/ 1/ 6 WORKOUT, 1000M FACE

P A Y M E N T I N V O I C E	
PRINCIPAL	967779.49
3 DAYS ACCRUED INT	739.58
TOTAL	968519.07
I N C O M E	
REDEMPTION VALUE	1000000.00
COUPON PAYMENT	754375.00
INTEREST @ 9.435%	364424.59
TOTAL	2118799.59
R E T U R N	
GROSS PROFIT	1150280.52
RETURN -2 /YR COMP	9.435

D E T A I L E D   A N A L Y S I S
HIT 1 <GO>: YIELD TO CALL
HIT 2 <GO>: PRICE TABLE
HIT 3 <GO>: TOTAL RETURN
HIT 4 <GO>: OPTION ADJUSTED SPREAD

	A	B	C	D	E	F	G	H	I
1		**PAGENET BOND**							
2									
3									
4	Settlement date (current date)	4-Aug-97							
5	Bond coupon	8.875%	<-- Interest paid semiannually						
6	Price	96.777949							
7	Maturity	1-Feb-06							
8	Date of last interest payment	1-Aug-97							
9	Date of next interest payment	1-Feb-98							
10	Days from last interest to settlement	3							
11	Days from last interest to next interest	184							
12									
13	**Invoice price calculation**								
14	Price	96.7779							
15	Accrued interest	0.0724	<-- Should be (8.875%/2 * 3 days / 184)*100						
16	**Invoice price**	96.8503							
17				**Note**: Bloomber calculates accrued interest based on					
18				30 day months: =3/180*8.875/2. This gives					
19	**Yield calculation**			0.073958333					
20									
21	**Date**	**Payment**							
22	4-Aug-97	-96.8503		**Yield to maturity**					
23	1-Feb-98	4.4375		**XIRR**	9.6460%	<-- =XIRR(B22:B39,A22:A39)			
24	1-Aug-98	4.4375		**YIELD**	9.4347%	<-- =YIELD(B4,B7,B5,B6,100,2)			
25	1-Feb-99	4.4375							
26	1-Aug-99	4.4375		**Notes**					
27	1-Feb-00	4.4375		**XIRR** is the actual IRR of the payments, taking into account the					
28	1-Aug-00	4.4375		actual bond payment dates					
29	1-Feb-01	4.4375		**YIELD** is the standardized yield assuming 30 day months (360 day years)					
30	1-Aug-01	4.4375							
31	1-Feb-02	4.4375							
32	1-Aug-02	4.4375		**Current yield**	9.170%	<-- =B5*100/B6			
33	1-Feb-03	4.4375							
34	1-Aug-03	4.4375							
35	1-Feb-04	4.4375							
36	1-Aug-04	4.4375							
37	1-Feb-05	4.4375							
38	1-Aug-05	4.4375							
39	1-Feb-06	104.4375							

GENERAL ELECTRIC CAPITAL CORP. BOND

DG26 **Corp**   Y A
ENTER ALL VALUES AND HIT <GO>.
                              Y I E L D   A N A L Y S I S   CUSIP: 36962FMM
GENL ELEC CAP   GE 5.88 09/15/08 95.0117/ 95.0117 (6.52 /52) BFV @ 7:56
P R I C E   95.011726   S E T T L E M E N T   D A T E   8/ 4/1997
current yield 6.189   See <Help> W ORST   C A S H F L O W   A N A L Y S I S

Y I E L D	MATURITY	9/15/2008
C A L C U L A T I O N S	9/15/ 8	@100.000
STREET CONVENTION	6.517	6.517
U.S. GOVT EQUIVALENT	6.517	6.517
COMPUCORP/MONROE(TM)	6.517	6.517
TRUE YIELD	6.516	6.516
EQUIVALENT 1/YR COMPOUND	6.623	6.623
JAPAN INTEREST (CSIMPLE)	6.661	6.661
PROCEEDS/MMKT (ACT/360)		
A F T E R T A X :		
INCOME 39.60% CAPITAL 28.00%	4.011	4.011

TO 9/15/ 8 WORKOUT, 1000M FACE	
P A Y M E N T I N V O I C E	
PRINCIPAL	950117.26
139 DAYS ACCRUED INT	22703.33
TOTAL	972820.59
I N C O M E	
REDEMPTION VALUE	1000000.00
COUPON PAYMENT	676200.00
INTEREST @ 6.517%	307882.41
TOTAL	1984082.41
R E T U R N	
GROSS PROFIT	1011261.82
RETURN -2 /YR COMP	6.517

S E N S I T I V I T Y A N A L Y S I S		
CNV DURATION (YEARS)	8.039	8.039
ADJ/MOD DURATION	7.786	7.786
RISK	7.574	7.574
CONVEXITY	0.784	0.784
PRICE VALUE OF A 0.01	0.07574	0.07574
YIELD VALUE OF A 0 1/32	0.00413	0.00413

D E T A I L E D   A N A L Y S I S
HIT 1 <GO>: TOTAL RETURN
HIT 2 <GO>: PRICE TABLE

	A	B	C	D	E	F	G	H	I
1		GE BOND							
2									
3									
4	Settlement date (current date)	4-Aug-97							
5	Bond coupon	5.880%	<-- Interest paid semiannually						
6	Price	95.0117							
7	Maturity	15-Sep-08							
8	Date of last interest payment	15-Mar-97							
9	Date of next interest payment	15-Sep-97							
10	Days from last interest to settlement	142							
11	Days from last interest to next interest	184							
12									
13	**Invoice price calculation**								
14	Price	95.0117							
15	Accrued interest	2.2689	<-- Should be 5.880%/2 * 142 days / 184						
16	**Invoice price**	97.2806							
17				**Note**: Bloomberg calculates accrued interest based on					
18				30 day months: =139/180*5.88/2. This gives					
19	**Yield calculation**			2.270333333					
20									
21	Date	Payment							
22	4-Aug-97	-97.2806		**Yield to maturity**					
23	15-Sep-97	2.94		**XIRR**	6.6181%	<-- =XIRR(B22:B45,A22:A45)			
24	15-Mar-98	2.94		**YIELD**	6.5167%	<-- =YIELD(B4,B7,B5,B6,100,2)			
25	15-Sep-98	2.94							
26	15-Mar-99	2.94		**Notes**					
27	15-Sep-99	2.94		**XIRR** is the actual IRR of the payments, taking into account the					
28	15-Mar-00	2.94		actual bond payment dates					
29	15-Sep-00	2.94		**YIELD** is the standardized yield assuming 30 day months (360 day years)					
30	15-Mar-01	2.94							
31	15-Sep-01	2.94							
32	15-Mar-02	2.94		**Current yield**	6.189%	<-- =B5*100/B6			
33	15-Sep-02	2.94							
34	15-Mar-03	2.94							
35	15-Sep-03	2.94							
36	15-Mar-04	2.94							
37	15-Sep-04	2.94							
38	15-Mar-05	2.94							
39	15-Sep-05	2.94							
40	15-Mar-06	2.94							
41	15-Sep-06	2.94							
42	15-Mar-07	2.94							
43	15-Sep-07	2.94							
44	15-Mar-08	2.94							
45	15-Sep-08	102.94							

Why is the YTM of Pagenet = 9.6460% >> 6.6181%?

- **GE's bond is for 11 years, Pagenet's is for 8.5 years. Downsloping term structure? This is unlikely, as the following graph shows (Pagenet is rate B; the B-yield curve is not reported on Bloomberg).**

FAIR MARKET YIELD CURVES — HISTORY
MATURITY RANGE 3MO - 30Y

Legend:
- 8/ 4/97:BBB1 FINANCE
- 8/ 4/97:BBB2/BBB3 FINANCE
- 8/ 4/97:AAA - IND

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Princeton:609-279-3000   Singapore:226-3000   Sydney:2-9777-8666   Tokyo:3-3201-8900   Sao Paulo:11-3048-4500
I384-406-0 28-Jul-98 13:58:30
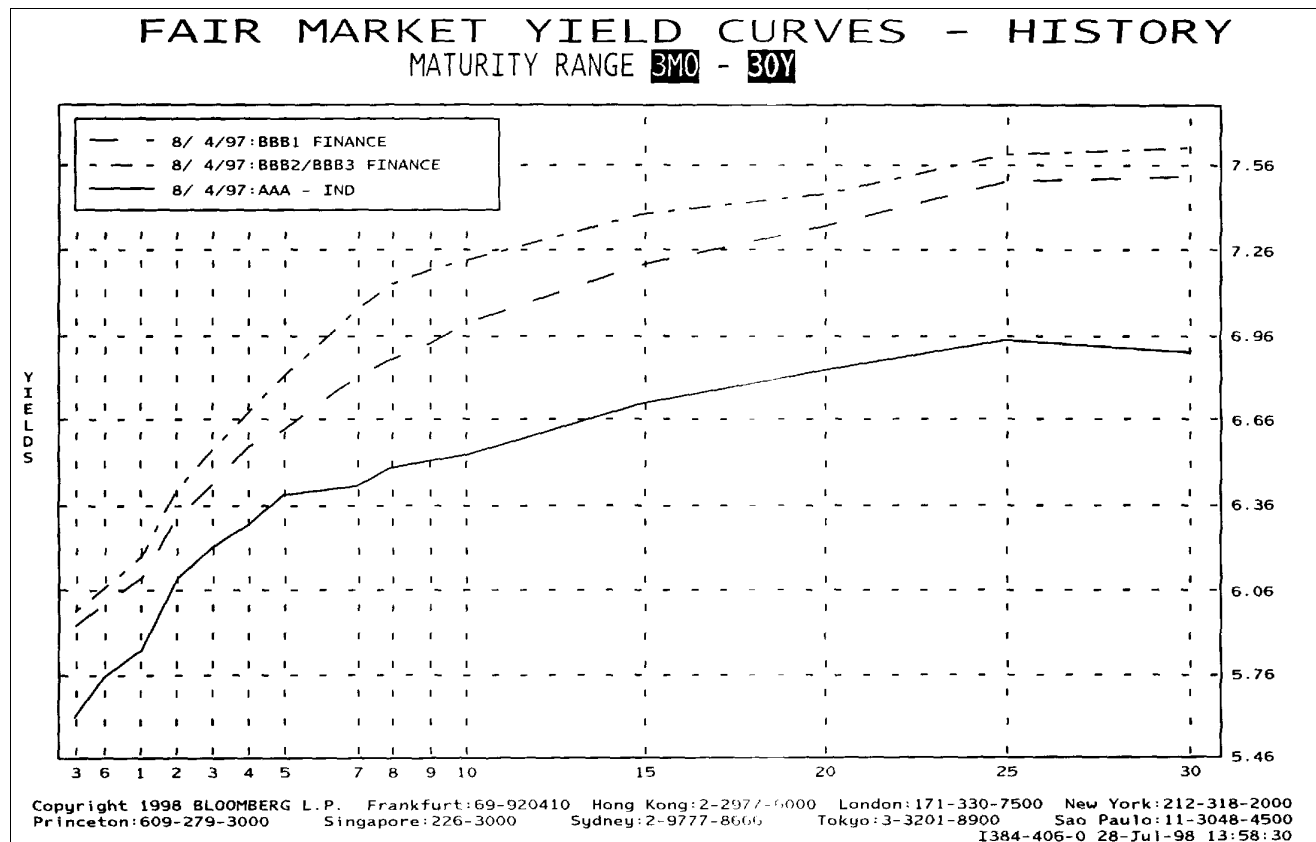
- **Risk premium? GE's bond is rated AAA, Pagenet is rated B. This is surely the primary reason for the difference in the yields.**

NOTE: The YTM is *not* an *expected return*, it is an IRR based on the *promised payments*. This is UNLIKE any other return we calculate in finance! All costs of capital are based on *expected returns*.

NOTE: In second set of slides we show that:

- **Expected Pagenet bond yield = 7.392% << 9.457% = YTM**

TWO PROBLEMS

1. Calculate the COST OF DEBT in order to calculate the WACC—for this you need the EXPECTED BOND RETURN.

NOTE: It may not matter that much:

$$WACC = E(r_E)\frac{E}{E + D} + E(r_D)*(1 - t_C)\frac{D}{E + D} \ .$$

If $\dfrac{D}{E + D} = 20\%, \ \ t_C = 40\%$. **Then whether Pagenet's**

$E(r_D) = 9.5\% \ \ or \ \ 7.4\%$ **will change the WACC by**

$$\Delta WACC = \left[9.5\% - 7.4\%\right]*(1 - t_C)\frac{D}{E + D}.$$

$$= 2.1\% * 0.6 * 0.2 = 0.25\%$$

This is well within the usual bounds of error for most WACCs!

2. Value a bond. Here there are two approaches:

- **Standard finance approach:**

  Discount *expected bond payments* at *expected (risk-adjusted) bond return*.

  This gets us back to the problem of YTM versus expected bond return.

- **Standard industry approach:**

  Discount *promised bond payments* at *rating-adjusted YTM*