



# SESSION 6: ESTIMATING COST OF DEBT, DEBT RATIOS AND COST OF CAPITAL

# What is debt?

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- For an item to be classified as debt, it has to meet three criteria:
  - It has to give rise to a contractual commitment, that has to be met in good times or bad.
  - That commitment usually is tax deductible
  - Failure to make that commitment can cost you control over the business.
- Using these criteria, all interest-bearing commitments, short term as well as long term, are clearly debt. So, are all lease commitments.
- The items below can be debt, if they meet other conditions
  - Accounts payable & supplier credit, but only if you are willing to make the implicit interest expenses (the discounts lost by using the credit) explicit.
  - Under funded pension and health care obligations, but only if there is a legal requirement that you cover the underfunding with fixed payments in future years.

# Estimating the Cost of Debt

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- The cost of debt is the rate at which you can borrow at currently, It will reflect not only your default risk but also the level of interest rates in the market.
- The two most widely used approaches to estimating cost of debt are:
  - Looking up the yield to maturity on a straight bond outstanding from the firm. The limitation of this approach is that very few firms have long term straight bonds that are liquid and widely traded
  - Looking up the rating for the firm and estimating a default spread based upon the rating. While this approach is more robust, different bonds from the same firm can have different ratings. You have to use a median rating for the firm
- When in trouble (either because you have no ratings or multiple ratings for a firm), estimate a synthetic rating for your firm and the cost of debt based upon that rating.

# Estimating Synthetic Ratings

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- The rating for a firm can be estimated using the financial characteristics of the firm. In its simplest form, the rating can be estimated from the interest coverage ratio

$$\text{Interest Coverage Ratio} = \text{EBIT} / \text{Interest Expenses}$$

- For Embraer's interest coverage ratio, we used the interest expenses from 2003 and the average EBIT from 2001 to 2003. (The aircraft business was badly affected by 9/11 and its aftermath. In 2002 and 2003, Embraer reported significant drops in operating income)

$$\text{Interest Coverage Ratio} = 462.1 / 129.70 = 3.56$$

# Interest Coverage Ratios, Ratings and Default Spreads: 2003 & 2004

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If Interest Coverage Ratio is	Estimated Bond Rating	Default Spread(2003)	Default Spread(2004)
> 8.50	(>12.50) AAA	0.75%	0.35%
6.50 - 8.50	(9.5-12.5) AA	1.00%	0.50%
5.50 - 6.50	(7.5-9.5) A+	1.50%	0.70%
4.25 - 5.50	(6-7.5) A	1.80%	0.85%
3.00 - 4.25	(4.5-6) A-	2.00%	1.00%
2.50 - 3.00	(4-4.5) BBB	2.25%	1.50%
2.25- 2.50	(3.5-4) BB+	2.75%	2.00%
2.00 - 2.25	((3-3.5) BB	3.50%	2.50%
1.75 - 2.00	(2.5-3) B+	4.75%	3.25%
1.50 - 1.75	(2-2.5) B	6.50%	4.00%
1.25 - 1.50	(1.5-2) B-	8.00%	6.00%
0.80 - 1.25	(1.25-1.5) CCC	10.00%	8.00%
0.65 - 0.80	(0.8-1.25) CC	11.50%	10.00%
0.20 - 0.65	(0.5-0.8) C	12.70%	12.00%
< 0.20 (<0.5)	D	15.00%	20.00%

# Cost of Debt computations

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- The cost of debt for a company is then the sum of the riskfree rate and the default spread:
  - Pre-tax cost of debt = Risk free rate + Default spread
  - The default spread can be estimated from the rating or from a traded bond issued by the company or even a company CDS.
- Companies in countries with low bond ratings and high default risk might bear the burden of country default risk, especially if they are smaller or have all of their revenues within the country. Larger companies that derive a significant portion of their revenues in global markets may be less exposed to country default risk. In other words, they may be able to borrow at a rate lower than the government.
- The synthetic rating for Embraer is A-. Using the 2004 default spread of 1.00%, we estimate a cost of debt of 9.29% (using a riskfree rate of 4.29% and adding in two thirds of the country default spread of 6.01%):  
Cost of debt  
= Riskfree rate + 2/3(Brazil country default spread) + Company default spread = 4.29% + 4.00% + 1.00% = 9.29%

# Weights for the Cost of Capital Computation

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- In computing the cost of capital for a publicly traded firm, the general rule for computing weights for debt and equity is that you use market value weights.
- That is not because the market is right but because that is what it would cost you to buy the company in the market today, even if you think that the price is wrong.

# Estimating Cost of Capital: Embraer in 2004

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## □ Equity

- ▣ Cost of Equity =  $4.29\% + 1.07 (4\%) + 0.27 (7.89\%) = 10.70\%$
- ▣ Market Value of Equity = 11,042 million BR (\$ 3,781 million)

## □ Debt

- ▣ Cost of debt =  $4.29\% + 4.00\% + 1.00\% = 9.29\%$
- ▣ Market Value of Debt = 2,083 million BR (\$713 million)

## □ Cost of Capital

$$\text{Cost of Capital} = 10.70\% (.84) + 9.29\% (1 - .34) (0.16) = 9.97\%$$

- The book value of equity at Embraer is 3,350 million BR.
- The book value of debt at Embraer is 1,953 million BR; Interest expense is 222 mil BR; Average maturity of debt = 4 years
- Estimated market value of debt =  $222 \text{ million (PV of annuity, 4 years, 9.29\%)} + \$1,953 \text{ million}/1.0929^4 = 2,083 \text{ million BR}$



# If you had to do it....Converting a Dollar Cost of Capital to a Nominal Real Cost of Capital

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- Approach 1: Use a BR riskfree rate in all of the calculations above. For instance, if the BR riskfree rate was 12%, the cost of capital would be computed as follows:
  - Cost of Equity = 12% + 1.07(4%) + 0.27 (7.89%) = 18.41%
  - Cost of Debt = 12% + 1% = 13%
  - (This assumes the riskfree rate has no country risk premium embedded in it.)
- Approach 2: Use the differential inflation rate to estimate the cost of capital. For instance, if the inflation rate in BR is 8% and the inflation rate in the U

Cost of capital=

$$(1 + \text{Cost of Capital}_{\$}) \left[ \frac{1 + \text{Inflation}_{\text{BR}}}{1 + \text{Inflation}_{\$}} \right]$$
$$= 1.0997 (1.08/1.02) - 1 = 0.1644 \text{ or } 16.44\%$$

# Dealing with Hybrids and Preferred Stock

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- When dealing with hybrids (convertible bonds, for instance), break the security down into debt and equity and allocate the amounts accordingly. Thus, if a firm has \$ 125 million in convertible debt outstanding, break the \$125 million into straight debt and conversion option components. The conversion option is equity.
- When dealing with preferred stock, it is better to keep it as a separate component. The cost of preferred stock is the preferred dividend yield. (As a rule of thumb, if the preferred stock is less than 5% of the outstanding market value of the firm, lumping it in with debt will make no significant impact on your valuation).

# Recapping the Cost of Capital

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