

Chapter 16

16-1

Income bonds do share some characteristics with preferred stock. The primary difference is that interest paid on income bonds is tax deductible while preferred dividends are not. Income bondholders also have prior claims on the assets, if the firm goes bankrupt. In calculating cost of capital, the primary difference again will be that the cost of income bonds will be lower, because of the tax savings.

16-2

Commodity bonds are different from straight bonds because the interest payments on these bonds are not fixed but vary with the price of the commodity to which they are linked. There is more risk, therefore, to the holder of these bonds. It is different from equity since the cash flows are constrained. Even if the commodity's price does go up, the payments on the commodity bond will go up only by the defined amount, whereas equity investors have no upside limit. Commodity bondholders also have prior claims on the assets of the firm if the firm goes bankrupt. I would treat commodity bonds as debt, but recognize that it is also debt that creates less bankruptcy risk if the firm gets into trouble due to commodity price movements.

16-3

The first characteristic - a fixed dividend and a fixed life - is a characteristic of debt, as is the last one - no voting rights. The other two - no tax deductions and secondary claims on the assets - make it more like equity. In fact, this security looks a lot like preferred stock, and I would treat it as such.

16-4

Value of Straight Preferred Stock portion of Convertible = $6/.09 = \$66.67$! Perpetual Life

Value of Conversion Portion = $\$105 - \$66.67 = \$38.33$

16-5

The convertible bond is a 10-year bond with a face value of \$1000 and a coupon rate of 5%. If it yielded the same rate as the straight bond, i.e. 8%, its price would be equal to

$\frac{25}{.04} \left(1 - \frac{1}{1.04^{20}}\right) + \frac{1000}{1.04^{20}} = 796.15$, assuming semi-annual coupons. Hence, the equity

component of the convertible can be estimated as $1100 - 796.15 = 303.85$.

The total equity component of the firm's asset value = $50(1 \text{ m.}) + 303.85(20000) = \56.077m.

The debt component = $\$25\text{m.} + 796.15(20000) = 40.923\text{m.}$

Hence, the debt ratio = $40.923/(40.923 + 56.077) = 42.19\%$

16-6

Value of Equity = $50,000 * \$100 + 100,000 * \$90 = \$14,000,000$

Value of Debt = \$5 million

$$\text{Debt Ratio} = 5/(5+14) = 26.32\%$$

Since the debt was taken on recently, it is assumed that the book value of debt is equal to market value.

16-7

There are two factors. One is that small high growth companies do not have substantial current cash flows. Convertible bonds, by keeping the interest expense low, allow these companies to borrow. The second factor is that small high growth companies tend to be volatile. This volatility makes the conversion option more valuable to investors, and reduces the interest expense on the debt further.

16-8

Not necessarily. The coupon rate is lower on convertible debt but it also includes a valuable conversion option. I would value the conversion option before I concluded that convertible debt was cheaper.

16-9

Value of Common Stock = 1 million * 50 = \$50 million

Value of Warrants = 200,000 * \$12 = \$2.4 million

Value of Straight Debt = \$250 million

Value of Straight Debt portion of Convertible Debt
= $10,000 * (60 * (PVA, 9\%, 10) + 1000 / 1.09^{10})$ = \$8.075 million

Value of Conversion Option (Equity) = 10,000 * 1000 - \$8.075 million = \$1,925,000

Value of Debt = \$250 + \$8.075 = \$258.075 million

Value of Equity = \$50 + \$2.4 + \$1.925 million = \$54.325 million

Debt Ratio = $258.075 / (258.075 + 54.325)$ = 82.61%

16-10

While venture capitalists may demand a disproportionate share of the ownership, this may reflect the higher risk that they face. Furthermore, many of these firms would not have been able to raise needed funds if venture capitalists had been unwilling to step in and provide it.

16-11

Bank debt may be preferable for those companies which have substantial private information on their riskiness (or lack of it). While they may not be willing to reveal this information to bond markets (where even competitors could observe it), they may be willing to reveal it to a bank (where there is a greater chance of confidentiality).

16-12

I do not think so. The fixed claims that preferred stockholders have make them more like debt. If the preferred stock is cumulative, I would treat it more like debt.

16-13

Interest is tax deductible, whereas preferred dividends are not. This statement is generally true, at least for firms paying taxes.

