

- Later, Miller extended the theory to include **personal taxes**. The introduction of personal taxes reduces, but does not eliminate, the benefits of debt financing. Thus, the **Miller model** also leads to 100% debt financing.
- The introduction of growth changes the MM and Hamada results for the levered cost of equity and the levered beta.
- If the firm is growing at a constant rate, the debt tax shield is discounted at r_{sU} , and debt remains a constant proportion of the capital structure, then

$$r_{sL} = r_{sU} + (r_{sU} - r_d) \frac{D}{S}$$

and

$$b = b_U + (b_U - b_D) \frac{D}{S}$$

- When debt is risky, management may choose to default. If the debt is zero coupon debt, then this makes equity like an option on the value of the firm with a strike price equal to the face value of the debt. If the debt has periodic interest payments then the equity is like an option on an option, or a **compound option**.
- When a firm has risky debt and equity is like an option, management has an incentive to increase the firm's risk in order to increase the equity value at the expense of the debt value. This is called **bait and switch**.

Questions

- (26-1) Define each of the following terms:
- MM Proposition I without taxes and with corporate taxes
 - MM Proposition II without taxes and with corporate taxes
 - Miller model
 - Financial distress costs
 - Agency costs
 - Trade-off model
 - Value of debt tax shield
 - Equity as an option
- (26-2) Explain, in words, how MM use the arbitrage process to prove the validity of Proposition I. Also, list the major MM assumptions and explain why each of these assumptions is necessary in the arbitrage proof.
- (26-3) A utility company is allowed to charge prices high enough to cover all costs, including its cost of capital. Public service commissions are supposed to take actions that stimulate companies to operate as efficiently as possible in order to keep costs, and hence prices, as low as possible. Some time ago, AT&T's debt ratio was about 33%. Some individuals (Myron J. Gordon, in particular) argued that a higher debt ratio would lower AT&T's cost of capital and permit it to charge lower rates for telephone service. Gordon thought an optimal debt ratio for AT&T was about 50%. Do the theories presented in the chapter support or refute Gordon's position?
- (26-4) Modigliani and Miller assumed that firms do not grow. How does positive growth change their conclusions about the value of the levered firm and its cost of capital?