Chapter 17 Does Debt Policy Matter?

OVERVIEW

This chapter is entirely devoted to the explanation of MM's Propositions I and II. Proposition I was proved (or demonstrated) using a simplified version of MM's "arbitrage" proof. MM's Proposition II was derived using Proposition I. The effect of leverage on the "beta" was discussed. The traditional position on the Weighted Average Cost of Capital (WACC) was also discussed. Reasons for financial innovation and how violations of MM propositions create opportunities for financial innovations were indicated. Lastly, the WACC was explained using the Union Pacific example.

LEARNING OBJECTIVES

To understand:

- MM's Propositions I and II
- assumptions under which these propositions are derived
- traditional position on capital structure
- weighted Average Cost of Capital (WACC)
- effect of leverage on the firm's value, cost of debt, cost of equity, and the overall cost of capital under MM's propositions and under the traditional position.

The effect of financial leverage in a competitive tax-free economy

It may be argued that the choice of capital structure is a *marketing* problem; that is, the problem is to find the combination of securities that has the greatest overall appeal to investors and therefore maximises the market value of the firm. However, MM's Proposition I states that all combinations of debt and equity are equally good. This was illustrated by a simplified version of MM's "arbitrage" proof; numerical examples were given. Proposition I can be generalised as the law of conservation of value: The value of the pie is independent of how it is sliced. Operating income vs. EPS analysis is explained, using a numerical example. MM's Proposition I is again proved using a homemade leverage argument. To state this algebraically: $V_U = V_L$

Financial risk and expected returns

MM's Proposition II, relating the equity capitalisation rate to leverage, is developed and illustrated. The effect of capital structure on the return on equity, along with the idea of changing financial risk for the shareholders is discussed using numerical examples. It is also shown how leverage affects the equity beta using numerical examples. The effect of leverage on "beta" is discussed using a numerical example. The following relations were also elaborated and proved:

$$r_E = r_A + (r_A - r_D)(D/E)$$
$$r_A = r_D(D/V) + r_E(E/V)$$
$$V = D + E$$

$$\beta_A = \beta_D(D/V) + \beta_E (E/V)$$

where: r_A = expected return on assets
r_E = expected return on equity
r_D = expected return on debt
D = market value of debt
E = market value of equity
V = market value of the firm
β = risk

The weighted average cost of capital

The traditional position is that the WACC is a U-shaped function of leverage. This can only happen in imperfect capital markets. Market imperfections are not sufficient for the traditional position, however. High transaction costs of personal borrowing might create a clientele for leveraged shares. The most serious capital market imperfections are generally those created by the government. The financing objective is best expressed as "find the package of securities that maximises firm value," not "find the package of securities that minimises the WACC." Capital markets do evolve over time; new securities are invented and become popular. This shows that Proposition I is not always strictly and universally true. If it were, there would be no demand for new types of securities. Yet, it is difficult to think of new security types that corporations could issue and thereby tap a clientele of constrained investors.

A final word on the after-tax WACC

When corporate taxes are introduced then the cost of debt is much cheaper than other sources of funds. The after-tax WACC is calculated using the formula

$$\text{After-tax WACC} = r_D(1- T_C) (D/V) + r_E(E/V)$$