

FNCE20001: Tutorial 11 (Notes)

Modigliani and Miller Analysis

- Important assumptions:
 - i) Perfect capital markets
 - ii) No taxes
 - iii) Companies and individuals can borrow at the same interest rate
 - iv) No costs associated with the liquidation or reorganisation of a company in financial difficulty
 - v) Companies have a fixed investment policy so that investment decisions are not affected by financing decisions
- **Proposition 1:** The value of a company is independent of its capital structure [Law of conservation of value]
- **Proposition 2:** A company's weighted average cost of capital is independent of the company's capital structure [Law of conservation of risk]

Modigliani and Miller Proposition 2

- Business risk associated with the company's assets remains the same regardless of its capital structure
 - k_0 can be interpreted as the rate of return required because of the company's business risk (recall that if there is no debt, $k_e = k_0$)
- Borrowing by a company increases a shareholder's expected rate of return in direct proportion to the company's debt-to-equity ratio
 - The financial risk associated with borrowing causes the shareholders' required rate of return to increase **exactly** in line with the increase in their expected rate of return
 - This extra expected rate of return is **just enough** (no more or no less) to compensate for the extra financial risk
 - Thus, borrowing by a company has **no effect** on its shareholders' wealth
- The weighted average cost remains the same when there is a change in capital structure
 - This is because, when the company changes its capital structure, the securities market reacts by also changing the market values of the company's debt and the market value of the company's equity

Capital Structure and Taxes

- i) Classical Tax System
 - Company profit is taxed after allowing a deduction for interest on debt
 - Therefore, borrowing causes a significant reduction in company tax. These tax savings are referred to as the **interest tax shield**
 - This leads to an increase in after-tax net cash flows to investors and so the firm's value increases
- ii) Imputation Tax System
 - Potentially, the tax system may be neutral – the choice of capital structure does not affect a company's value
 - Franked dividends are taxed at the shareholders' personal tax rate
 - Interest is taxed at the lenders' personal tax rate
 - Potentially, the tax system may have a bias towards equity
 - This is especially applicable to those who have a high marginal personal tax rate due to the prospect of lower taxes on capital gains owing to the option of being able to defer capital gains tax (by selling their shares later)
 - Either way, it does not favour the use of debt finance by companies, and so borrowing is not likely to add value to the firm
 - The interest rate paid will reflect personal tax rates on interest that are equal to or higher than the overall tax rates on equity returns

These are the costs associated with financial distress

- Financial distress is a situation where a company's financial obligations cannot be met, or can be met only with difficulty
- These costs depend on the probability of bankruptcy and the extent of the costs incurred if bankruptcy occurs
 - i) Lenders bear the realised liquidation costs
The costs incurred in administering the liquidation reduce the pool of funds available for distribution to lenders
 - ii) Shareholders will bear the expected liquidation costs
Potential lenders should realise that they will suffer in the event of liquidation and thus respond by demanding a higher interest rate on their loans
- The probability of bankruptcy depends on the company's business risk and its level of financial leverage
- **Direct** costs of financial distress (bankruptcy costs)
 - Costs associated with financial distress that leads to a transfer of company control to lenders
 - Refers to the out-of-pocket costs associated with receivership or liquidation, which includes fees paid to parties such as lawyers, accountants and liquidators
- **Indirect** costs of financial distress
 - Costs associated with the threat of corporate bankruptcy
 - Refers to costs associated with factors such as lost sales, reduced operating efficiency and the cost of managerial time devoted to attempts to avert failure

Capital Structure and Agency Costs

- Conflicts of interest between lenders and shareholders
 - Involves the transfer of wealth from lenders to shareholders
 - Examples of conduct include:
 - i) Claim dilution
 - ii) Dividend payout
 - iii) Asset substitution
 - iv) Underinvestment
 - Higher interest rates may be charged by lenders to compensate for losses that may be suffered. This imposes a cost that will be borne largely by shareholders
 - Covenants may be imposed to prevent undesirable conduct. This will affect company value and shareholders' wealth because monitoring will be required to ensure compliance and there may be opportunity costs where the covenants are too restrictive
- Conflicts of interest between managers and shareholders
 - A possible consequence of the separation of control and ownership
 - Examples of conduct include:
 - i) Lack of motivation to work hard
 - ii) Use of free cash flows to benefit themselves rather than shareholders
 - Aligning the objectives of managers with those of shareholders may prevent undesirable conduct. Measures can include remuneration tied to profits and employee share ownership schemes

MM Dividend Irrelevance Theory

- Assumptions:
 - The company has a given investment plan, and has determined how much of the assets to be acquired will be financed by borrowing
 - There is a perfectly competitive capital market, with not axes, transaction costs, flotation costs or information costs

- Investors are rational so they always prefer more wealth to less and are equally satisfied with a given increase in wealth, regardless of whether it is in the form of a cash paid out or an increase in the value of the shares they hold
- Trade-off between:
 - Higher dividends and issuing shares; and
 - Lower dividends and retaining earnings (or repurchasing shares)
- Dividend payout policy is irrelevant to shareholders' wealth and firm value
 - The value of a company depends only on its investments
- Partial liquidation of a company (by paying a dividend and not issuing shares) cannot increase shareholders' wealth
 - Shareholders can achieve the same result by selling a part of their holding to other investors – this is a 'homemade dividend'
- De Angelo and De Angelo argue there exists an *implicit* assumption that the *full* present value of a company's free cash flow to paid out to shareholders over the life of the enterprise
 - This is known as the full payout policy
 - Free cash flows are defined as cash flows in excess of those required to fund all available projects that have positive net present values
 - Payout policy does matter (contra MM)
If part of a company's free cash flow is never paid out, company value will be reduced. Therefore, managers should adopt a full payout policy
- The form and timing of dividend payments are irrelevant

Relaxing the MM Assumptions

- Transaction Costs (e.g. brokerage fees)
 - A dividend clientele may emerge with the introduction of these costs
 - May not necessarily increase the market value of a company
 - ✓ Competition among companies to cater to some clientele could result in an equilibrium – where the supply of dividends is equal to investors' demand for cash payouts
 - ✓ If such an equilibrium exists and the needs of all investor clienteles are met, then one clientele is as good as another
- Flotation Costs
 - A company that raises funds externally will incur flotation costs
 - The existence of flotation costs provides an incentive to preserve shareholders' wealth by restricting dividends
- Taxation
 - i) Classical Tax System (unfranked dividends)
 - Shareholders who pay higher tax on dividends prefer capital gains
 - Shareholders who pay similar tax on dividends and capital gains are indifferent
 - Shareholders who pay lower tax on dividends prefer dividends
 - ii) Imputation Tax System (franked dividends)
 - Shareholders with low personal marginal tax rates prefer dividends
 - Shareholders with high personal marginal tax rates prefer capital gains
 - iii) Capital gains are effectively taxed twice (as they involve retention of profits, where the profits have been subject to company income tax, along with capital gains tax) – but capital gains tax can be deferred (by selling the shares later)

Effects of Payout Decisions

- Information effects and signalling to investors
 - Changes in dividends will convey management's 'inside' information about future cash flows to the market – especially for companies with a smooth dividend policy
 - ✓ Due to the existence of information asymmetry
 - ✓ This is consistent with the MM dividend irrelevance theorem

- ✓ *Contra* DD – the share market places a value on the dividends itself because investors value securities only for the payouts they are expected to provide
- May provide a credible signal about the ‘quality’ of a company
 - ✓ The payment of dividends is evidence that the company generates sufficient cash to be able to pay dividends
 - ✓ It also provides information on management’s expectations as to future profitability
- Agency Costs
 - Paying higher dividends may reduce agency costs
 - May force a company to raise capital externally more frequently
 - May prevent overinvestment of free cash flows
- Catering Theory
 - Suggests that managers cater to changes over time in investor demand for dividends. For example, by paying dividends when investors place higher value on dividends
 - Three foundations: investor irrationality, failure of arbitrage and catering by managers

Useful Formulae

Modigliani and Miller

- Proposition 2

- Cost of equity

$$k_e = k_o + (k_o - k_d) \cdot \frac{D}{E}$$

- Systematic risk of equity

$$\beta_e = \beta_o + (\beta_o - \beta_d) \cdot \frac{D}{E}$$

- Dividend Irrelevance Theory

- Sources and uses of funds

$$X + mP_1 = nD_1 + I$$

$$nD_1 = X - I + mP_1$$

X = cash from operations; I = investments

mP₁ = cash from new shares issued (there are m new shares issued)

nD₁ = dividends paid (there are n shares for which dividends are paid)

- Value of the firm

$$V_0 = \frac{X - I + (n + m)P_1}{1 + k_e}$$

- Value of the firm with corporate tax

- Unleveraged firm

$$V_U = E_U = \frac{EBI \cdot (1 - t_c)}{k_o}$$

- Leveraged firm (but no financial distress)

$$V_L = V_U + t_c D$$

This includes the interest tax shield, given by $t_c D$

- Leveraged firm (with financial distress)

$$V_L = V_U + PV(\text{tax shield}) - PV(\text{bankruptcy costs} + \text{agency costs})$$

- Dividend policies

- Pure residual dividend policy

$$D_t = E_t - I_t$$

- Smooth (or fixed) dividend policy

$$D = E(E) - E(I)$$

- Constant payout dividend policy

$$D_t = \alpha E_t$$