Final Review

Outline of Major Topics Since the Midterm

I. Market Efficiency

-- central idea: its very tough to make abnormal returns on the basis of publicly available information (semi-strong form efficiency); lots of investors are smart

-- basis for focus on properly discounted cashflows (rather than accounting numbers) in determining firm value to claimants

-- basis for Modigliani and Miller propositions on payout policy and capital structure

-- reference for interpretation of event studies (e.g., excess returns around a dividend increase)

II. Options

-- Basic terminology (puts, calls, long, short, exercise price, premium, etc.)

-- Payoff tables and diagrams

-- Put-call parity formula

-- Binomial pricing

-- Applications:

  • embedded options in real investment projects
  • equity and risky debt as options
  • source of conflict of interest between debt and equity holders
III. The Yield Curve

-- The market discounts cashflows arriving at different future times by different rates.

-- A yield curve constructed from price information on zero coupon bonds can be used to price other cashflows.

-- Embedded in the yield curve is a set of implied forward rates. These are rates you can lock in today for borrowing and lending in the future.

-- The shape of the yield curve conveys information about expected future short term spot interest rates. (Understand the distinction between the expectations hypothesis and the liquidity premium.)

IV. Financial Contracts

-- A financial contract represents a claim to a set of specified cashflows

-- Stocks, bonds, convertibles, warrants, etc. are all claims to share of firm cashflows

-- Tie-in to market efficiency: the total value of a firm's assets is divided between these claimants

-- The value of each contract is determined by its risk/return characteristics

V. Payout Policy

-- Miller-Modigliani implies firm value not affected by dividend policy if investment policy held constant (in a perfect market). Useful (despite perfect market assumption) because:

  • focuses on the do-it-yourself option
  • emphasizes that firm value is determined primarily by investment decisions, not by payout policy
  • explains why price drop on ex-dividend date is approximately equal to the amount of the dividend payment
-- Tax Effects

- differential tax rates create tax clienteles for different payout policies
  
  * for most investors effective tax rate on capital gains is lower (due to ability to defer, lower statutory rate, ability to use losses to offset gains)

  * implication that many investors should prefer repurchases to dividends, hence (unsolved) "dividend puzzle"--why is so much money paid out in the form of a dividend?

  * however some investors prefer dividends (e.g., corporations) or are indifferent between dividends and repurchases (e.g., tax exempts)

- since investors already have a wide choice of firms with a variety of payout policies, a firm's dividend policy should have little influence on its value due to tax considerations

-- Signalling

- the market generally interprets increased payouts as good news (increased dividends or a repurchase)

- interpretation is that signals managers expectation of higher future earnings

- the signal is credible because if the firm is short on cash later on, it is costly to raise capital (either through debt or equity issue, or by cutting dividends later on)

VI. Capital Structure

-- Miller-Modigliani implies firm value not affected by capital structure if investment policy held constant (in a perfect market). Useful (despite perfect market assumption) because:

  - focuses on the do-it-yourself option

  - emphasizes that total firm value is determined primarily by the investment decisions that determine cashflows, not by way these cashflows are split between claimants

-- Tax effects

- the choice of capital structure can affect the total taxes paid on the firm's profits; minimizing taxes maximizes shareholder value.

- deductability of interest payments by corporation creates tax advantage of debt over equity at corporate level
• the tax advantage of debt is partially offset by the higher personal taxes paid on
interest income than on income from equity (a combination of dividends and
capital gains)

• definitions:
  
  * the "annual tax shield" provided by debt is equal to the total interest
    payments made = \( r_dD \) (some of this tax shield may be unused)

  * the "annual value of the tax shield" is the tax savings generated: \( T^* r_dD \)
    (this assumes all of the tax shield is used--it must be adjusted down if
    some is extra) \( T^* = \tau_c \) if only corporate taxes are considered. In general
    \( T^* = \left[ 1 - (1-\tau_c)(1-\tau_{pe})/(1-\tau_{pd}) \right] \).

  * the "value of the tax shield" is the present value of the annual tax shields
    over the life of the firm or project. It is common to discount these savings
    using \( r_d \) if only corporate taxes are considered, and by \( r_d(1-\tau_{pd}) \) if both
    personal and corporate taxes are considered.

  * If the debt is perpetual and all tax shields can be used, the PV of the tax
    shields can be approximated by \( T^* D \).

-- Financial distress costs

• probability of financial distress goes up with more debt

• direct cost of distress estimated to be small, but potentially large indirect costs
  (conflict of interest between equity and debt holders, loss of employees and
  customers, long litigation, inability to make +NPV investments, etc.)

-- Trade-off theory is that firms balance the tax advantages of debt with the costs of financial
distress and other leverage-related costs. Implication is that certain firms can support
higher debt (e.g., highly profitable, stable earnings, tangible assets)

-- Signalling

• the market generally interprets equity issues (from established firms) as bad news

• interpretation is that signals managers believe firm to be currently overvalued
  (opposite of repurchase which is good news)

• "pecking order theory" says that to avoid information problems and transactions
  costs, firms prefer to finance investments with retained earnings, then debt, and
  only equity as a last resort. (See discussion in B&M)

• IPOs have positive excess returns on average in first few days after issue.
  Interpretation is that investment banks purposely underprice to ensure success in
  selling.
VII. Interaction of investment and financing decision

-- Adjusted present value method (APV) adds costs and benefits of financial side effects to NPV analysis

- NPV analysis discounts project free cash flows by a discount rate reflecting the asset risk. The result is $V_U$, the value of the project if it is all equity financed.

- Debt capacity is valuable when additional borrowing generates usable tax shields. There is no exact way to measure debt capacity, but factors to consider include risk of associated cashflows and collateral value of assets.

- Other financial side effects include value of subsidized loans, issue costs associated with debt and equity.

- Taking all these factors into account, $V_L = V_U + PV(\text{tax shields}) - PV(\text{leverage-related costs})$

-- Adjusted discount rate methods (ADR) try to incorporate value of tax shields by changing the discount rate. As with APV, you discount the free cashflows from the project, not just the cashflows going to the equity holders. Methods used include:

- Modigliani-Miller formula: $r^* = r_{EU}(1-T^*L)$
  where $L = D/V_L$

- Weighted average cost of capital:
  $WACC = r_D(1-T^*)(D/V_L) + r_E(E_L/V_L) = r^*$

Both are equivalent and correct under very specific assumptions.

-- Other financial side effects (e.g., issue costs) must be taken into account separately as they are in an APV analysis.

-- The APV method and the ADR method should produce the same answer when used correctly. Doing an APV analysis is always a good check on an ADR calculation because it is more explicit about the costs and benefits assumed.