

# Leverage, Dividends, Mergers, & Acquisitions

Finance 476  
Week 4 Lecture Notes  
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Welcome to the fourth week of Finance 476. This week we will discuss both financial and operating leverage, dividend policy and briefly cover some important topics having to do with mergers and acquisitions.



# Overview

- Capital structure and leverage
  - Risk
  - Optimal capital structure
  - Theory of capital structure
- Dividends and distribution policy
  - Dividends effect on stock price
  - Distribution theories
- Mergers and acquisitions
  - Terms and definitions
  - Accounting conventions

Capital structure can determine the amount of financial leverage, but it is important to first consider the operating leverage inherent in the firm's cost structure. Firms with high fixed costs have higher operating leverage positions than firms with few fixed costs. Within each operating leverage construction lies an optimal structure for the capital financing of the firm. The theory of capital structure can help determine what this optimal structure is and how it can be achieved.

Dividend policy is an outgrowth of the capital structure of the firm. Dividends have a definite effect on stock price; with various theories being advanced in the academic literature to explain this effect. We will examine several theories and discuss which may be correct and under what circumstances.

Mergers and Acquisitions is a diverse and complex topic. We will limit our discussion to some of the terms used to describe various M&A activities and to a superficial discussion of the "purchase" and "pooling" methods of accounting for mergers and acquisitions.

## Operating Risk (Leverage)

- Business risk
  - Variability of returns
- Sources of operating risk
  - Demand variability
  - Pricing power
  - Input costs
  - Time to market
  - Foreign exposure
  - Operating leverage

$$ROIC = \frac{NOPAT}{CAPITAL}$$

$$ROIC_{DEBT=0} = ROE = \frac{NICS}{COMEQUITY}$$

Operating risk refers to financial risk. As we have studied in FIN 475, financial risk has to do with the variability of returns. Because firms with high fixed costs relative to variable costs have the possibility to make or lose larger amounts of money than firms with higher variable costs, these firms are said to be more risky. Operating risk can be determined by computing the Return on Equity (ROE) for a firm with no debt. This would isolate the operating risk from the financial risk that exists due to the capital structure of the firm.

Sources of operating risk include variations in the inputs and outputs of a firm. For example, if a firm earns 10% EBIT on sales of \$10MM with fixed costs of \$8MM, then their variable costs must be \$1MM. This is a highly rigid cost structure. Now say that their sales fall to \$9MM. Since they still have fixed costs of \$8MM, and variable costs are 10% of sales (1MM/10MM from the first case), their EBIT would fall to \$100K, a 90% reduction due to a 10% reduction in sales. Now consider what happens when the sales fall but the operating leverage is such that the fixed costs are only \$5MM, with variable costs of \$4MM at a \$10MM sales level. The profit in the first case is the same, \$1MM or 10% of the firm's sales. But variable costs are 40% of the total cost structure. Now say that sales fall to \$9MM as before. Fixed costs are now \$5MM, with variable costs of 40% of \$9MM or \$3.6MM. In this case, the profit still falls, but to \$400K. This fall of 60% is a much better result than the 90% of the high fixed cost case. You can see that high operating leverage through high fixed costs in a cost structure can yield to unacceptable risk for investors.

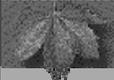
The other sources of risk have similar effects on the returns of the firm.

## Operating Leverage

- Related to fixed vs. Variable costs
  - Higher fixed costs means higher operating leverage and more risk
  - Breakeven
    - Q = number of units so EBIT=0
    - F = fixed cost per unit
    - P = price per unit
    - V = variable cost per unit

$$Q = \frac{F}{P - E}$$

One way to determine the degree of operating leverage inherent in a firm's price structure is to compute the breakeven quantity,  $Q$ .  $Q$  represents the number of units of production that must be sold, shipped and invoiced to cover both fixed and variable costs with no profits for the owners. Since there are no profits,  $Q$  represents the quantity of sales where EBIT is equal to zero. The formula illustrated can be used in the simple manufacturing case to compute the breakeven point,  $Q$ .



## Breakeven Analysis Generalized

- What if no “units” are produced
  - Breakeven analysis in terms of sales dollars
    - S=total sales to breakeven
    - V=variable cost as percent of sales
    - F=total fixed costs in dollars

$$S = \frac{F}{(1 - V)}$$

Not all firms, however, produce products that can be measured as units sold. For example, a lawyers office can hardly categorize its production as units, though they may substitute “billable hours” as a proxy for units produced. An easier and more accurate way of looking at the breakeven analysis that is applicable to all firms in all businesses is to compute the dollar amount of sales that result in the fixed costs being covered by the contribution margin on sales. To do this, costs have to be categorized into fixed and variable columns. Taking the fixed costs and dividing by the contribution margin (1-V) will yield the amount of sales necessary for breakeven in any given year.



## Operating Leverage

### ■ High Q or S to breakeven

- More risky, as if S is not met, losses result
- Should take on less debt to offset operating leverage
- Profit responds more readily to cost cutting or incremental sales

### ■ Lower Q or S to Breakeven

- Less Risky, since lower sales levels needed to cover overhead
- Cost control issue
- Profit responds less to incremental sales

As sales approach the breakeven point, incremental sales produce larger and larger changes (on a per-cent basis) in EBIT. Therefore, firms with high breakeven points (in sales or units) have higher operating leverage and therefore higher risks. If the sales figure for breakeven is not met, the firm will lose money and possibly be unable to pay its creditors. Therefore, firms with high operating leverages (or breakeven points) should construct a capital structure that is relatively light in debt.

Firms with little operating leverage can offset the lack of leverage by adding financial leverage through the purchase of debt instruments. In both cases, control of costs is key to successful survival and profitability of the firm, regardless of the source of leverage (financial or operating). Leverage is desirable to a degree because leverage acts as a profit multiplier to sales while increasing the risk of the investment in the firm.



## Capital Structure

$$WACC = w_d k_d (1 - T) + w_c k_s$$

- Capital structure is decision on debt to equity ratio
- WACC sensitive to capital structure decisions
- Financial leverage

While there are many complex decisions involved in setting up a capital structure, the main decision to be made is how much debt to use in financing the operations of the firm. The weighted average cost of capital reflects both the weighting of the firm's debt to equity and the differences in cost (after taxes) between debt and equity. The higher the amount of debt in the financial structure of the firm, the more financial leverage is being applied to the firm's balance sheet.



## Hamada Equation

$$b = b_u [1 + (1 - T)(D / E)]$$

- Can use published  $b$  and  $D/E$ ,  $T$  to find  $b_u$
- Use to determine effect of Debt Ratio ( $D/E$ ) on  $b$

To quantify the effect of financial leverage on the firm's stock price, Hamada proposed the equation noted here. The so-called Hamada equation can be used to see what the effect of varying debt to equity ratios would have on the variability of the firm's stock price measured against normal market fluctuations. The "unlevered beta,"  $b_u$  is found by taking the market beta and dividing by the term  $(1+(1-T)D/E)$ . This unlevered beta is then used to estimate the effect on the market beta,  $b$  of changes in  $D/E$ .



## Modigliani and Miller (MM)

- Value of firm not function of Debt Ratio
  - No brokerage costs
  - No taxes
  - No bankruptcy costs
  - Investors borrow at same rate as company
  - Information is symmetric
  - EBIT is not affected by use of debt

Modigliani and Miller (MM) were two finance professors who proposed the idea that a firm's value (as reflected by its stock price) would not be affected by the capital structure. MM used the assumptions that brokerage and bankruptcy costs were zero, no taxes were levied on the firm, investors could borrow at the same rate as the company, information was perfectly symmetric and that debt level did not affect EBIT. While their conclusion is correct for the stated case, their work is more important for identifying the things that influence capital structure policy and that do also effect the value of the firm.



## Dividends and Distributions

- Dividend Policy
- DRIPS
- Stock Dividends and Splits
- Stock Repurchases

Once a capital structure policy is determined, the firm must determine its dividend policy. Dividend policy includes how much to pay out, when to pay it, how such payments are to be made, and when to change the amount and/or timing of the payment. Related issues include the decision to offer DRIPS (Dividend Reinvestment Plans), stock dividends, and to split or repurchase shares of ones own stock.



## Dividend Effect on Share Price

- MM: Dividends irrelevant
  - No brokerage costs
  - No taxes
- Bird in the hand
- Tax Preference
- Signaling
- Shareholder Profile

The same MM professors proposed that share prices would not be effected by Dividend policy if there were no brokerage costs and if taxes were indifferent to dividends and capital gains. Other theories seek to explain why investors seem to have a preference for dividends. These theories include the “bird in the hand” theory which states that investors prefer some cash now to promises of riches later; the tax preference theory which states that investors prefer capital gains to dividends due to favorable tax treatment of the capital gain, signaling theory which is built on the presumption that information is not symmetric but that when management increases or decreases dividends it is signaling the market as to the opinion of the management of the viability of the firm, and shareholder profile theory which states that different classes of shareholders have preferences between receipt of dividends and capital gains.

# Dividend Stability

- Residual Model
  - Cover capital budget with RE, use rest for dividends
- Small Regular plus Extra
  - Set normal dividend low, distribute what is left as special dividend



Stability is the name of the game in dividend policy. Firms generally like to keep dividends at a steady or steadily increasing dollar amount. One way to do this would be to set a small “normal dividend” that the firm would be willing and able to pay even in very poor economic conditions. In addition to the “normal” dividend, these firms would pay an “extra” or special dividend to the shareholders in good years or in years where not many capital expansion projects were found. This strategy would allow some flexibility in payouts while maintaining a steadily growing “normal” dividend for investors.

The other extreme would be the residual model. In the residual model, the company would pay out only those dividends that are supported by the cash from operations after deducting the capital budget. This would be highly variable from year to year and would endanger the stock price in the case where the dividend wildly fluctuates.

## Drips

- Reinvest Dividends with firm directly
  - No brokerage costs
  - Proceeds new capital
  - Open Enrollment
  - Large Firms (P&G, Exxon, etc...)



DRIPS or DRPs are programs where investors can buy shares directly from the companies without brokerage costs. This kind of purchase can be used to produce new capital from investors; in fact many utilities use such plans as does P&G. Some plans allow so-called “open” enrollment, where non-shareholders can buy shares of the stock directly even if they do not own shares and have not yet earned any dividends. Most of these plans are run by large firms with the resources to implement them on a wide scale. These include P&G, Duke Power Company, and Exxon, to name a few.



## Constraints on Dividend Policy

- Bond Indentures
- Preferred Stock Restrictions
- Impairment of Capital Rule
- Cash Required to Pay
- Penalty Tax
- Investments Available
- Available Sources of Capital

Dividend policy can not be formulated in a vacuum. Constraining managements ability to pay dividends are the demands of the other providers of capital to the firm as well as the government. Bonds often have “indentures,” which are terms and conditions which limit managements ability to pay dividends. If this were not the case, management could pay all of the assets of the firm out to shareholders in the form of dividends, leaving the bondholders without any assets to lay claim to in the event of a bankruptcy.

Preferred stock has a provision that allows the company to defer payment of the dividend for an indefinite period.

The same provision, however, usually requires that the company pay the current and all back dividends so deferred prior to paying any dividend on the common stock.

The government also has several restrictions on dividend payments, including penalties for too much payout (impairment of capital) and too little payout (penalty for tax avoidance).

Finally, the cash has to be available to finance the payment or other sources of capital have to be available in order to raise the necessary cash.

## Stock Splits, Repurchase and Stock Dividends

- Splits
  - No effect on share price
- Repurchase
  - Tax Advantage
- Stock Dividends
  - Less than splits



Related to dividends are stock splits, repurchases or dividends paid as shares of stock.

Many companies believe that the optimal price of a share of stock is between \$20 and \$80 per share. Therefore, when the stock is outside this range for an extended period of time, the company may declare a split. The split can take any form (2:1 or 1 for 2 in a reverse split), but 2:1 is common. The 2 for 1 split would take the stock price to 50% of its current value. Splits in stock have no effect on the price of a stock. A stock selling for \$200 per share prior to a 2:1 split would sell for \$100 per share immediately after the split. The new portfolio would have two shares of \$100 stock for each share of \$200 stock previously held. Therefore, the investor would see no net gain or loss on the deal.

Instead of paying out a dividend to the shareholder, the company can use the cash to repurchase shares of its own stock on the open market. The repurchased stock becomes “treasury” stock on the balance sheet. With fewer shares in circulation on the open market, we would expect the share price to increase proportionately.

Finally, stock dividends allow payment of dividends in the form of shares of stock. This type of payment would have the same effect on the share price as a stock split unless shares are purchased from the open market to pay the dividend, in which case they would have the same effect on the price as a straight repurchase.



## M&A Terms

- Target
- Acquirer
- Synergy
- Horizontal vs. vertical
- Cogeneric
- Conglomerate
- Hostile takeover
- Holding Company
- Friendly Merger
- Tender Offer
- Proxy Fight
- White Knight
- White Squire
- Poison Pill
- LBO
- Risk Arbitrage
- Divestiture
- Joint Venture

Mergers and acquisitions are a complex art (the art of the deal). We will limit our discussion to some of the colorful terms used in M&A circles:

Target: Company being acquired.

Acquirer: Company doing the buying

Synergy: Gain to be made by combination of the operations of two firms.

Horizontal: Merger with a firm that makes the same products or offers the same service as the acquirer.

Vertical: Merger with a firm up or down the acquirers supply chain

Cogeneric: Merger with a firm in a similar business; high degree of synergy

Conglomerate: Collection of unrelated firms

Hostile Takeover: Acquirer makes an offer to buy the firm over the objection of management

Holding Company: Company that owns the firms but is not generally involved in day to day operations

Friendly Merger: Management supports the acquisition of the target

Tender Offer: Direct offer to shareholders to buy their shares

Proxy Fight: Acquiring firm asks shareholders to assign their votes to them while management tries to get sufficient votes to block the takeover.

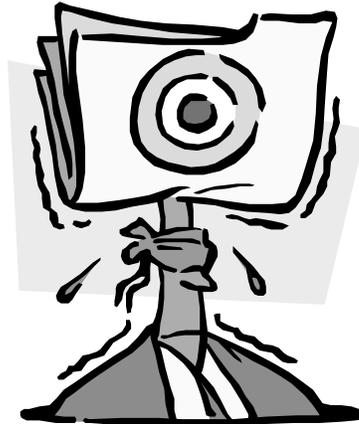
White Knight: Firm that is desirable to management for the takeover which “saves” the firm from a hostile takeover

White Squire: Person or entity who buys sufficient share volume to block a hostile takeover

Poison Pill: Financial event triggered on sale of a firm designed to discourage the sale.

## Valuing the Target Firm

- Discounted Free Cash Flow
- Multiple Model



One of the toughest parts of M&A activities is the determination of the value of the target firm. Many methods are used, but the most common is the discounted free cash flow method. In this method, the cash flows of the combined firm are compared to the pre-merger cash flow predictions for a ten year period. The incremental cash flows (the difference between the pre and post merger predictions for cash flow) are discounted at the acquiring firms WACC for the ten years. Cash flows after year ten are predicted to be constant and are computed as a perpetuity in year 10. The resulting net present value is divided by the number of shares in circulation to determine the per-share value of the target firm to the acquiring firm.

A more “seat-of-the-pants” approach to valuing the target firm is the use of the multiple model. Some value is placed on each average customer of the firm and this value is multiplied by the number of customers to arrive at a cash value of the firm. The value is derived from market data for the business in which the target firm operates. For example, each Sprint PCS customer might be worth \$500.00 to the acquiring firm. If sprint had 1,000,000 customers, this would value their business as \$500MM. This figure would then be divided by the number of shares outstanding to arrive at a value of the firm.



## Merger Accounting

- Pooling
  - Stock Deals
  - Combine Balance Sheets
- Purchase Accounting
  - Goodwill
  - Effects on future EBIT and EPS

Once the deal is made, the question turns to the need to combine the firms not only physically but also financially. There are two disparate ways to account for the transaction. In pooling, the balance sheets are combined and there is no effect on future EBIT or EPS through the merger transaction. In purchase accounting, the purchase assets of the target firm are added to the acquiring firms balance sheet and any overage is added in a separate category called “goodwill.” Goodwill has to be amortized over 40 years, resulting in higher costs over the amortization period. This means that EBIT and therefore EPS are affected by the merger. When an acquiring company purchases the target for cash, purchase accounting has to be used.

## Conclusions

- Capital structure and risk tied together
- Dividend Policy affects capital budget and vice versa
- M&A Complex Game



As we have seen, decisions regarding capital structure affect not only the cost of capital but also the risk profile of the firm. Dividend policy is tied to the capital structure of the firm and the effect that a changing policy has on a share price. Finally, we discussed briefly Mergers and Acquisitions and saw that the process of buying another company is filled with complexity.

### Discussion Questions

1. All else being equal, which firm is likely to have a higher variation in returns:

Firm A has 50% debt and 50% common equity on its balance sheet.

Firm B has 20% debt, 30% preferred stock and 50% common equity on its balance sheet.

Justify your answer.

2. Which of the following companies would likely have a higher stock price, given that their operating and financial leverage positions were identical and that their market positions were similarly identical:

Firm A has a policy of paying a 25 cent per share dividend with extra dividends to be paid when quarterly results allow sufficient cash distributions after the capital budget is satisfied. The firm has paid the same dividend for twenty five years as a percent of share price, and has a historic dividend yield of 3%.