Fundamental Analysis

• Present value approach
  – Capitalization of expected income
  – Intrinsic value based on the discounted value of the expected stream of cash flows
• Multiple of earnings approach
  – Valuation relative to a financial performance measure
  – Justified P/E ratio

Present Value Approach

• Intrinsic value of a security is
  \[
  \text{Value of security} = \sum_{t=1}^{n} \frac{\text{Cash Flows}}{(1 + k)^t}
  \]
• Estimated intrinsic value compared to the current market price
  – What if market price is different than estimated intrinsic value?

Required Inputs

• Discount rate
  – Required rate of return: minimum expected rate to induce purchase
  – The opportunity cost of dollars used for investment
• Expected cash flows
  – Stream of dividends or other cash payouts over the life of the investment

Required Inputs

• Expected cash flows
  – Dividends paid out of earnings
    • Earnings important in valuing stocks
  – Retained earnings enhance future earnings and ultimately dividends
    • Retained earnings imply growth and future dividends
    • Produces similar results as current dividends in valuation of common shares
Dividend Discount Model

- Current value of a share of stock is the discounted value of all future dividends

\[ P_0 = \frac{D_1}{(1 + k_{cs})} + \frac{D_2}{(1 + k_{cs})^2} + \cdots + \frac{D_n}{(1 + k_{cs})^n} \]

- Must estimate future dividends
- Dividends may be expected to grow over time
- Must model expected growth rate of dividends and need not be constant

Dividend Discount Model

- Problems:
  - Need infinite stream of dividends
  - Dividend stream is uncertain
  - Must estimate future dividends

- Dividends may be expected to grow over time
  - Must model expected growth rate of dividends and need not be constant

Dividend Discount Model

- Assume no growth in dividends
  - Fixed dollar amount of dividends reduces the security to a perpetuity

\[ P_0 = \frac{D_0}{k_{cs}} \]

- Similar to preferred stock because dividend remains unchanged

Dividend Discount Model

- Assume a constant growth in dividends
  - Dividends expected to grow at a constant rate, \( g \), over time

\[ P_0 = \frac{D_1}{k - g} \]

- \( D_1 \) is the expected dividend at end of the first period
- \( D_1 = D_0 \times (1 + g) \)

Dividend Discount Model

- Implications of constant growth
  - Stock prices grow at the same rate as the dividends
  - Stock total returns grow at the required rate of return
    - Growth rate in price plus growth rate in dividends equals \( k \), the required rate of return
  - A lower required return or a higher expected growth in dividends raises prices

Dividend Discount Model

- Multiple growth rates: two or more expected growth rates in dividends
  - Ultimately, growth rate must equal that of the economy as a whole
  - Assume growth at a rapid rate for \( n \) periods followed by steady growth

\[ P_0 = \sum_{t=1}^{n} \frac{D_0(1 + g)^t}{(1 + k)^t} + \frac{D_n(1 + g)}{k - g} \left( \frac{1}{(1 + k)^n} \right) \]
Dividend Discount Model

- Multiple growth rates
  - First present value covers the period of super-normal (or sub-normal) growth
  - Second present value covers the period of stable growth
    - Expected price uses constant-growth model as of the end of super- (sub-) normal period
    - Value at \( n \) must be discounted to time period zero

Example: Valuing equity with growth of 30% for 3 years, then a long-run constant growth of 6%

\[
\begin{array}{c|cccc}
0 & k=16\% & 1 & 2 & 3 \\
g = 30\% & 4.48 & 5.02 & 5.63 & 59.68 \\
5.63 & 8.788 & 9.315 \\
74.81 = P_0 \times .10 \\
\end{array}
\]

What About Capital Gains?

- Is the dividend discount model only capable of handling dividends?
  - Capital gains are also important
- Price received in future reflects expectations of dividends from that point forward
  - Discounting dividends or a combination of dividends and price produces same results

Intrinsic Value

- “Fair” value based on the capitalization of income process
  - The objective of fundamental analysis
- If intrinsic value \( >(<) \) current market price, hold or purchase (avoid or sell) because the asset is undervalued (overvalued)
  - Decision will always involve estimates

P/E Ratio or Earnings Multiplier Approach

- Alternative approach often used by security analysts
- P/E ratio is the strength with which investors value earnings as expressed in stock price
  - Divide the current market price of the stock by the latest 12-month earnings
  - Price paid for each $1 of earnings

P/E Ratio Approach

- To estimate share value
  \[ \text{P}_0 = \frac{\text{estimatedearnings}}{\text{justified P/E ratio}} = \frac{\text{P}_0}{\text{E}} \times \frac{\text{E}}{\text{E}} \]
- P/E ratio can be derived from
  \[ \text{P}_0 = \frac{D_1}{k - g} \text{ or } \frac{\text{D}_1/\text{E}_1}{k - g} \]
  - Indicates the factors that affect the estimated P/E ratio
P/E Ratio Approach

- The higher the payout ratio, the higher the justified P/E
  - Payout ratio is the proportion of earnings that are paid out as dividends
- The higher the expected growth rate, g, the higher the justified P/E
- The higher the required rate of return, k, the lower the justified P/E

Understanding the P/E Ratio

- Can firms increase payout ratio to increase market price?
  - Will future growth prospects be affected?
- Does rapid growth affect the riskiness of earnings?
  - Will the required return be affected?
  - Are some growth factors more desirable than others?
- P/E ratios reflect expected growth and risk

P/E Ratios and Interest Rates

- A P/E ratio reflects investor optimism and pessimism
  - Related to the required rate of return
- As interest rates increase, required rates of return on all securities generally increase
- P/E ratios and interest rates are indirectly related

Which Approach Is Best?

- Best estimate is probably the present value of the (estimated) dividends
  - Can future dividends be estimated with accuracy?
  - Investors like to focus on capital gains not dividends
- P/E multiplier remains popular for its ease in use and the objections to the dividend discount model

Which Approach Is Best?

- Complementary approaches?
  - P/E ratio can be derived from the constant-growth version of the dividend discount model
  - Dividends are paid out of earnings
  - Using both increases the likelihood of obtaining reasonable results
  - Dealing with uncertain future is always subject to error

Other Multiples

- Price-to-book value ratio
  - Ratio of share price to stockholder equity as measured on the balance sheet
  - Price paid for each $1 of equity
- Price-to-sales ratio
  - Ratio of a company’s total market value (price times number of shares) divided by sales
  - Market valuation of a firm’s revenues
Impact of the Market

- Pervasive and dominant
- The single most important risk affecting the price movement of common stocks
  - Particularly true for a diversified portfolio of stocks
  - Accounts for 90% of the variability in a diversified portfolio’s return
- Investors buying foreign stocks face the same situation

Required Rate of Return

- Minimum expected rate of return needed to induce investment
  - Given risk, a security must offer some minimum expected return to persuade purchase
  - Required RoR = RF + Risk premium
  - Investors expect the risk free rate as well as a risk premium to compensate for the additional risk assumed

Understanding the Required Rate of Return

- Risk-free rate
- \( RF = \text{Real RoR} + \text{Inflation premium} \)
  - Real rate of return is basic exchange rate in the economy
  - Nominal RF must contain premium for expected inflation
- The risk premium
  - Reflects all uncertainty in the asset

Passive Stock Strategies

- Natural outcome of a belief in efficient markets
  - No active strategy should be able to beat the market on a risk adjusted basis
- Emphasis is on minimizing transaction costs and time spent in managing the portfolio
  - Expected benefits from active trading or analysis less than the costs
Passive Stock Strategies

• Buy-and-hold strategy
  – Belief that active management will incur transaction costs and involve inevitable mistakes
  – Important initial selection needs to be made
  – Functions to perform: reinvesting income and adjusting to changes in risk tolerance

Passive Stock Strategies

• Index funds
  – Mutual funds designed to duplicate the performance of some market index
  – No attempt made to forecast market movements and act accordingly
  – No attempt to select under- or overvalued securities
  – Low costs to operate, low turnover

Active Stock Strategies

• Assumes the investor possesses some advantage relative to other market participants
  – Most investors favor this approach despite evidence about efficient markets

Active Stock Strategies

• Majority of investment advice geared to selection of stocks
  – Value Line Investment Survey
• Security analyst’s job is to forecast stock returns
  – Estimates provided by analysts
    • expected change in earnings per share, expected return on equity, and industry outlook
  – Recommendations: Buy, Hold, or Sell

Sector Rotation

• Similar to stock selection, involves shifting sector weights in the portfolio
  – Benefit from sectors expected to perform relatively well and de-emphasize sectors expected to perform poorly

Sector Rotation

• Four broad sectors:
  – Interest-sensitive stocks, consumer durable stocks, capital goods stocks, and defensive stocks

Market Timing

• Market timers attempt to earn excess returns by varying the percentage of portfolio assets in equity securities
  – Increase portfolio beta when the market is expected to rise

Market Timing

• Success depends on the amount of brokerage commissions and taxes paid
  – Can investors regularly time the market to provide positive risk-adjusted returns?
Efficient Markets and Active Strategies

- If EMH true:
  - Active strategies are unlikely to be successful over time after all costs
  - If markets efficient, prices reflect fair economic value
- EMH Proponents argue that little time should be devoted to security analysis
  - Time spent on reducing taxes, costs and maintaining chosen portfolio risk

Approaches to Stock Selection

- Technical analysis
  - Refers to the method of forecasting changes in security prices
  - Prices assumed to move in trends that persist
  - Changes in trends result from changes in supply and demand conditions
  - Old strategy that can be traced back to the late nineteenth century

Technical Analysis

- Not concerned with the underlying economic variables that affect a company or the market
  - The causes for the demand and supply conditions are not important
- Technicians use graphs and charts of price changes, volume of trading over time, and other indicators

Approaches to Stock Selection

- Fundamental Analysis
  - Assumes that any security (and the market as a whole) has an intrinsic value as estimated by an investor
  - Intrinsic value compared to the current market price of the security
  - Profits made by acting before the market consensus reflects the correct information

Fundamental Analysis

- Classic common stock selection strategies involve growth stocks and value stocks
  - Growth stocks carry investor expectations of above-average future growth in earnings and above-average valuations as a result of high price/earnings ratio
  - Value stocks feature cheap assets and strong balance sheets

Framework for Fundamental Analysis

- Top-down approach
  - First, analyze the overall economy and conditions in security markets
  - Second, analyze the industry within which a particular company operates
  - Finally, analyze the company, which involves the factors affecting the valuation models
### Economy/Market Analysis

- Assess the state of the economy and the outlook for variables such as corporate profits and interest rates
  - The status of economic activity has a major impact on overall stock prices
  - Investors cannot go against market trends
    - If markets move strongly, most stocks are carried along
  - 25% to 50% of variability in annual earnings attributable to the overall economy

### Industry Analysis

- An industry factor is the second component, after overall market movements, affecting the variability of stock returns
  - The degree of response to market movements can vary significantly across industries
  - The business cycle affects industries differently

### Company Analysis

- Security analysts typically assigned specific industries but reports deal with individual companies
- Close relationship between earnings per share and share prices
  - Dividends are closely tied to earnings, but not necessarily the current earnings
  - Earnings are key to fundamental analysis