Ch. 10 Common Stock Valuation

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Fundamental Analysis

- Usually involves using large amounts of company financial data, understanding the nature of the firm’s business, the industry it operates in (competitors, etc.) and the economic environment.
- Usually involves predicting future earnings or dividends.
- May involve using valuation models to estimate a present value for the stock (like we do for bonds).

Equity Valuation Methods

- **Fundamental analysis** usually considers the present value of future cash flows
- Sometimes called “Intrinsic Value”.
- One-period Model: assume you receive all cash flow after one year. We **assume one annual dividend** although dividends are usually quarterly. Assume we have estimated a price target, $P_1$ for year-end.
- **Then PV** = $(D_1 + P_1)/(1+r)$. Current Price, $P_0$, may or may not equal intrinsic value, $PV$.

Equity Valuation Methods: DDM

- **Dividend Discount Model**: assume you receive cash flow from dividends forever.
- $PV = D_1/(1+k) + D_2/(1+k)^2 + ... + D_n/(1+k)^n + ...$
- This method is manageable only if we make simplifying assumptions about $D$.
- (1) **Assume D grows at a constant rate “g”**.
- $D_0$ is the most recent dividend (already paid!).
- So $D_0(1+g) = D_1$; $D_0(1+g)^2 = D_2$; etc.
- $PV = \Sigma D_0(1+g)/(1+k)^t$ for years 1,2,3,…,∞

Equity Valuation Methods: DDM

- This can only be solved if it is a geometric series and can summed to a finite PV.
- Ex: $1/2 + 1/4 + 1/8 + 1/16 ...$ and so on, forever is an infinite series but clearly it sums to a finite value. Any infinite series that declines by a certain percent each time period is a geometric series and will have a finite sum.
- For the PV formula to have a sum, it must not blow up – this would be where the dividend increases at a rate “g” equal to or faster than we shrink the dividend using its rate if discount “k”.

Equity Valuation Methods: DDM

- So we have $PV = \Sigma D_0(1+g)/(1+k)^t$, $t = 1,..., \infty$
- 1) g must be constant over the period we are evaluating the PV.
- 2) g must be less than k.
- The formula for the $PV = D_0(1+g)/(k-g)$
- Consider no growth, then $g= 0$ and all dividends are equal $PV = D (1+0)/(k-0) = D/k$
- The above special case is sometimes called a perpetuity and is also useful in evaluating preferred stock.
Equity Valuation Methods: DDM

• A stock last paid a $1 dividend and you expect the dividend to grow at a rate “g” indefinitely. You assign the stock a RRR of $k = 9%$.
  
  • “g” = -6% 0% 6% 7% 10%
  • $PV = ? ? ? \infty$
  • For g = 6% $PV = \frac{$1.06}{.09 - .06} = $35.33$

Equity Valuation Methods: RRR

• What determines $k$ (RRR) and $g$ (growth)?
  
  • In the risk-return chapter we looked at theories of return: notably the CAPM with its reliance on $\beta$ to measure a security’s relative market risk (filtering out diversifiable company risk).
  
  • However, there is only weak evidence, if any, that high $\beta$ firms reward the risk-taker with higher returns. Even when we incorporate company risk to get total risk $\sigma$ (sigma), we find little or no relationship.

Equity Valuation Methods: DDM

• We also write $PV = \frac{D_1}{(k-g)}$.
  
  • RRR vs. IRR: write the above as $P_0 = \frac{D_1}{(k-g)}$, we have a price and wish to estimate an expected rate of return.
  
  • This is like YTM for bonds or IRR for capital budgeting.
  
  • $(k-g) = \frac{D_1}{P_0}$, $k = \frac{D_1}{P_0} + g$
  
  • In this formula we are not solving for $k=RRR$, rather the IRR. Using $k$ is a common and confusing practice.

Equity Valuation Methods: DDM

• For the rest:
  
  • “g” = -6% 0% 6% 7% 10%
  • $PV = $35.33 \infty$
  
  • Note, this model allows for negative growth, an example being a gold mine gradually exhausting it’s profitable resources.
  
  • Only the 10% does not work (negative value the formula predicts is really positive infinity)
  
  • Note how a slight increase in expected growth to 7% affects the PV.

Equity Valuation Methods: RRR

• We may be able to construct an objective measure of risk using leverage measures & measure how cyclical sales are, etc.
  
  • However we obtain the $\beta$’s value the text assumes the CAPM is still the best method (and in theory it should work).
  
  • $k = r_f + \beta(MRP)$ MRP: market risk premium
  
  • $r_t = r_t + \beta(E(r_M) - r_f)$ $E(r_M)$: expected return of the stock market
Multiple-Growth (Two-Stage) DDM

- What if we are able to estimate earnings and dividends over the next two or three years that reflect some one time events, but want to assume constant growth thereafter.
- Very common approach in among analysts.
- Assume last irregular dividend (before the one that grew at rate “g” is like \( D_0 \)). Assume two such dividends, then

\[
PV = \frac{D_1}{1+k} + \frac{D_2}{(1+k)^2} + \frac{D_2(1+g)/(k-g)}{1+k}
\]

Two-Stage DDM

- If the first dividend is $1 and the second is $2 and growth is 6% thereafter: RRR = 10%
- \( PV = \frac{D_1}{1+k} + \frac{D_2}{(1+k)^2} + \frac{D_2(1+g)/(k-g)}{1+k} \) (continue)
- \( = \frac{1}{(1+.10)} + \frac{2}{(1+.10)^2} + \frac{2(1+.06)/(.10-.06)}{1+.10} \)
- \( = \frac{0.91}{1+.10} + \frac{2}{(1+.10)^2} + \frac{53}{1+.10} \)
- \( = \frac{0.91}{1+.10} + \frac{45.45}{1+.10} = 46.36 \)

Price/Earnings Ratios

- The P/E ratios in the WSJ and other stock quote sources are ex post: they are the current price and the last 4 quarter’s earnings
- \( PE = \frac{P_0}{E_0} \)
- The P/E ratios in the text are anticipated and we use expected earnings for the next four quarters.
- \( PE = \frac{P_0}{E_1} = \frac{D_1/(k-g)}{E_1} \)
  - \( = \frac{D_1}{(E_1)/(k-g)} \)
  - \( = \text{PayoutRatio}/(k-g) \)

Equity Valuation Methods

- Bookvalue of a company (or more usually bookvalue/share) is an accounting measure of value and represents the historical cost of the assets in place, less depreciation and less liabilities (debt and preferred stock).
- Bookvalue is also called net worth or common equity. Finding bargains through buying stocks with low-price to book ratios is one the possible anomalies (exceptions) in Efficient-markets Theory.

Price/Earnings Ratios

- How does P/E change with growth?
- With risk?
- Inverting the P/E ratio gives the earnings yield \( = \frac{E_1}{P_0} \).
- The earnings yield has limited use, we cannot discount future earnings as some are usually retained and thus not part of that year’s cash flow. Still it is an estimate of shareholder return - especially in the no growth scenario and where the payout ratio is one.

Equity Valuation Methods

- Bookvalue can be easily distorted with stock buybacks: A company selling at three times book ($30 vs. $10) uses funds from retained earnings to buy back shares. By accounting rules, they pay $30 for something worth $10 and lose $20 a share purchased. If 10% of stock is repurchased, the firm loses $2 per share overall and bookvalue drops to $8 share. Buybacks are considered a good thing for shareholders (if the shares are retired and not handed out to executives - which is too often the case).
Price/Sales Ratio

• *No evidence* that buying stock with low prices relative to sales delivers superior returns.

• *P/S is often largely a function the industry the company is in.* (Retail has low P/S ratios)

• *P/S ignores leverage.*

• That is, according to the DuPont equation *earnings depend on sales but sales depends on assets, which are purchased with debt or equity.*

• *Use EV/S,* where EV is *enterprise value: the per share market price of the stock and the debt.*