DeMarche

Maximizing Shareholder Value by Improving Growth and Reducing the Company's Discount Rate

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Executive Summary

From a corporate finance and investment perspective, there is a wealth of literature showing that the growth and discount rates of a company are the two factors that management should focus on to maximize shareholder value. They are the drivers of the Price-to-Earnings ratio (P/E) and, ultimately, of value. Theoretically and empirically *P/E goes up as growth goes up* and, controlling for growth, *P/E goes down as the discount rate increases*.

When a company's stock is not "efficiently" priced by the market on the basis of its peer-matched growth and discount rates, a focused investor relations campaign by management should be developed.

Valuation

Valuation has a long history as a basic area of economic thought. Recognition should be given to John Burr Williams who formalized the process in his 1938 book on investment value.[1] Williams showed that investment value was the present value of all future cash flows.

A series of cash flows may be valued using several different techniques. In general, cash flows may be valued by estimating the *timing* and *amount* of the cash flows, and then *discounting* them at an appropriate rate of return. This is shown in the following formula:

$$V = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \bullet\bullet\bullet + \frac{CF_n}{(1+r)^n}$$

Where: V = The present value of the future stream of cash flows
CF_t = The expected cash flow to be received at time t
r = The appropriate rate of return associated with the cash flows

This approach is an accepted way to value a stream of cash flows and can be used to value companies, stocks, bonds and other assets. Using this approach for bonds or other contractual situations has the benefit that several of the variables are known, or at least relatively certain.

[1] Williams, John Burr, *The Theory of Investment Value*, Cambridge, Mass., Harvard University Press, 1938

Many variations of the basic approach have been developed for stocks, which have a greater number of unknowns. Jahnke[2] and Stalla[3] show how the formula can be rearranged. Many of these forms have taken on their own identity and have been adopted by some as "the right way" to value securities. Many practitioners may be confused by these multiple versions of the basic approach, or even the relationship between the terms of the formula. Some of the more widely recognized stock variations of Williams' classic formula include:

- Price Earnings Model (P/E)
- Dividend Model (DDM)
- Price/Book Value Model (P/BV)
- Price/Cash Flow Model (P/CF)

Rearranging The Formula

Jahnke showed that Williams' formula, expressed as a dividend discount rate model, below,

$$P = \frac{D_1}{(1+R)^1} + \frac{D_2}{(1+R)^2} + \bullet\bullet\bullet + \frac{D_n}{(1+R)^n}$$

and assuming constant growth, can be rearranged to:

$$P = \frac{D}{R-G}$$

or,

$$R = \frac{D}{P} + G$$

or,

$$P/E = \frac{(1 - PR)}{R-G}$$

where: P = Price
D = Dividend
R = Discount Rate
G = Growth Rate of Return
PE = Price/Earnings Ratio
PR = Payout Ratio

Thus, by rearranging terms you can change Williams' formula from solving for present value to solving for price, discount rate, or P/E. These changes, and the many versions of the basic

[2] Jahnke, William W., "The Growth Stock Mania Revisted," *Financial Analyst Journal*, 31, Jan/Feb 1975, 42-69

[3] Stalla, Robert, *CFA 1 Review Course Instructional Manual 1993*, Volume II, Stalla Seminars, Inc., Cleveland, Ohio 1993, EQ-19

model, cause confusion about the different models and which is "*best*." Given the same inputs or estimates, each variation results in a similar outcome.

Regardless of the approach, it is important to understand the terms used in the formula. It is obvious that earnings, dividends and the price of a stock are fundamental inputs of the traditional valuation technique. So is the required rate of return, or discount rate. It's interesting to note that the more popular variations of Williams' basic formula focus on the more *tangible* components of the forecasting problem; i.e., earnings, dividends and price.

Adding to the confusion is that there are other approaches to valuation than forms of discounted cash flow, such as ratio analysis (Sales/Price). Stalla points out that there are practical forecasting problems associated with all of the models, so that "other less sophisticated standards of value (models) are also employed."[4]

Analyzing the Required Rate of Return

Before beginning a more detailed discussion of the difficulties of forecasting the required rate of return, or discount rate, we should discuss or define several of the commonly used terms found in finance.

- **Required Rate of Return**: The return stock market investors collectively demand for the firm. It is established by the buyers and sellers of the firm's stock.

- **Discount Rate**: A generic term. When used for a specific company, it is interchangeable with the required rate of return.

- **Cost of Equity Capital**: Conventionally believed to be the same as the required rate of return.

To focus on the required rate of return, or discount rate, consider it in the form of the basic formula shown earlier that assumes constant growth:

$$R = \frac{D}{P} + G$$

Simplistic techniques may be used to estimate some of the variables. Dividend and price are readily available and trend analysis can be used as a basic projection of G. For established companies in stable industries, such a technique may be reasonable. But all of the knowledge pertaining to R is *implicit*. Because most companies are not both established and in stable industries, let us consider the *explicit* components of R.

[4] Stalla, Robert, *CFA 1 Review Course Instructional Manual 1993*, Volume II, Stalla Seminars, Inc., Cleveland, Ohio 1993, EQ-25

Certainly one component of R is a risk-free rate of return. From economic theory, and from a bond investor's perspective, we know investors require a basic return in order to save and invest their money. This has been called the savings premium. To this savings premium the market must add a maturity premium that induces investors to increase the maturity of their holding. Then, the market must add another premium, a quality or default premium, that induces investors to accept the default risk of non-government bonds.

In addition to a basic bond market rate, equity investors require a risk premium to induce them to own equities over bonds. Thus inflation and changes in interest rate levels, along with confidence in the economy and the market, all play an important role in setting the proper market discount rate for equity securities in general. Finally, qualitative differences *between* equity securities probably require a risk premium differential for specific securities.

Three known ways of estimating discount rates are CAPM, APT factor models and expected return factor models, depending on one's position or opinion about efficient markets. As Richard Roll pointed out in 1977, any test of CAPM is "...really a joint test of the CAPM and market efficiency."[5] Generally, APT also assumes efficient markets.

In setting prices, the market estimates future cash flows and then discounts them using their required rate of return. The hypothesis that current prices are an accurate and unbiased reflection of all available information is called *the efficient markets hypothesis*. If current prices are not an accurate and unbiased reflection of all available information, then we say the market is "inefficient."

Since current prices reflect the market's current perception of estimated cash flows and/or the appropriate discount rate, we assume there are certain factors that affect the market's required rate of return. If the stock market sets the price of a firm's stock so that the required rate of return (discount rate) compensates investors for the stock's various risk exposures, and if the market is inefficient, then the market's required rate of return can be estimated with a factor model. If the stock market is efficient, and the market's required rate of return is determined by a factor model, then the cost of capital and the market's required rate of return are one and the same. This is because the market accurately sets the stock price based on the best available estimates of cash flows, and discounts them at their required rate of return. (For a more complete discussion of Cost of Equity Capital, and DeMarche's unconventional position that there are more than one Cost of Equity Capital per company, see our white paper, "Cost of Equity Capital," John R. Dykes, CFA, 1994.

DeMarche is a proponent that the market is inefficient and that both the CAPM and APT models are quite limited. (See *The New Finance*, by Robert A. Haugen, Ph.D.[6]) As a result, we have

[5] Roll, Richard, "A Critique of the Asset Pricing Theory's Tests: Part I: On Past and Potential Testability of the Theory," *Journal of Financial Economics*, 4, 1977

[6] Haugen, Robert A., *The New Finance -- The Case Against Efficient Markets*, Prentice Hall, Englewood Cliffs, New Jersey, 1995

done extensive research, built several large databases, and developed our own family of factor models.

Analyzing Stock Price

Valuation tools can also be used to analyze and explain stock price behavior. Some of the factors explaining stock price are growth rate oriented; i.e., the market is estimating the future growth rate (of the dividend, if the form of Williams' formula you're using is a DDM). Other factors are associated with the proper rate of return, or discount rate. This can best be seen in the popular version of the formula solving for P/E, where:

$$P/E = \frac{(1-PR)}{R-G}$$

Table 1
Average P/E Multiples of Portfolios
First Quintiled by Growth and then Quintiled by Discount Rate
as of 6/30/95

			Discount Rate					
			Low 1	2	3	4	High 5	Combined
	Low	1	12.8	12.7	12.6	11.6	10.6	12.0
		2	17.1	14.0	13.8	12.9	12.3	14.0
Growth		3	15.3	15.6	15.4	13.9	12.6	14.6
		4	14.6	16.7	14.4	12.5	13.5	14.3
	High	5	18.4	15.6	17.7	14.6	15.4	16.3
	Combined		15.6	14.9	14.8	13.1	12.9	14.3

Notes:
1. We have excluded companies with negative expected earnings or with expected P/E multiples less than 0 or greater than 50.
2. The 450 stocks used here have had relatively stable payout ratios over the last 5 years.
3. Discount Rate = D/P + G.

Source: DeMarche Associates, Inc.

Using the database for our factor model and the DeMarche Expected Return factor model itself, we are able to construct Table 1 and show P/E quintiled first by growth, then by discount rate. In general, and as one would expect, *P/E goes up as growth goes up* and controlling for growth, *P/E goes down as the discount rate increases.*

We used our factor model to identify and quantify variables that are important for distinguishing factors that affect differences between the required rate of return, or discount rate, of one stock to another. Some of these factors may be true "risk factors" such as differences in financial policy (leverage) or industry risk. Others appear to be "inefficiencies," such as Price to Book and Changing Payout Ratio.

Five important factors that contribute to differing discount rates between stocks are: Price to Book, Price to Earnings, Earnings Growth Rate, Dividend Yield and Payout Ratio.

Management Decisions Affecting Value and Stock Price

Management can most affect value and stock price by increasing the company's growth or reducing its discount rate, both of which will probably lead to a higher P/E, as shown in Table 1.

Management may be able to increase growth by increasing unit sales growth, raising prices, or through operating and financing efficiencies. The company's discount rate can be lowered by reducing debt, improving margins, reducing volatility of earnings, etc.

In an inefficient market, it is also possible that the stock is perceived incorrectly. In other words, its true expected growth is higher than forecasted by the market or its discount rate is too high, as compared to other peer stocks and based on the properly understood fundamentals of the company. To the extent this condition exists, it provides the basis for a focused investor relations campaign by management.

For more information regarding Investor Relations or Corporate Finance applications, contact Steve Farrell at (913) 384-4994.