

## DIVIDEND DISCOUNT MODEL: METHODOLOGY REPORT

### Introduction

One of the most direct ways of valuing a company is through the use of the SEENSCO dividend discount model. Based on this model, the value of a company is equal to the present value of the expected future dividends and selling price of the stock. While many investors no longer use dividend discount models and consider the models outdated, much of the intuition that drives alternative valuation techniques are embedded in the models, which can perform extremely well in practice. In fact, there are specific companies where dividend discount models produce far superior results than alternatives for value estimation. This document outlines our general model and details the specific assumptions and screens used in deriving our buy/sell recommendations.

### The Investment Philosophy

When investors buy a stock, they generally expect to earn returns from two sources: (1) dividends earned throughout the period the stock is held and (2) proceeds from selling the stock at the end of the holding period. The value of the stock can therefore be defined as the present value of the future dividends and expected selling price of the stock over a defined investment horizon. The rationale underlying the model lies in the present value rule - that is the value of any asset equals the present value of expected future cash flows generated by the asset discounted at an interest rate reflecting the riskiness of the cash flows.

The basic structure of the model for a stock with a "t" year investment horizon is as follows:

$$P_0 = \frac{D_1}{(1+k_e)} + \dots + \frac{D_t}{(1+k_e)^t} + \frac{PE_{\text{terminal}} * EPS_{\text{terminal}}}{(1+k_e)^t}$$

Where:

$P_0$	=	Current Price
$D_n$	=	Dividends earned in period t
$PE_{\text{terminal}}$	=	Price earnings multiple at the end of the investment horizon
$EPS_{\text{terminal}}$	=	Expected earnings per share at the end of the investment horizon
$k_e$	=	Cost of equity (rate used to discount the investment's cash flows)

There are various inputs to the model--expected earnings, dividends, a terminal P/E multiple, discount rate--which will be described in detail in later sections. To obtain estimates for these key inputs, we make assumptions about expected future growth rates in earnings and payout ratios. The required rate of return on a stock is determined by its riskiness, equal to the effective interest rate on the company's debt plus an equity risk premium.

### Investor Suitability

Dividend discount models are useful for numerous investors and can add value in a variety of contexts.

- Dividend discount models are generally less speculative models. That is, proper application of the models will generally not result in highly unrealistic assumptions about stock price appreciation.
- Dividend discount models are easy to understand to almost all investors. Once you understand the math and establish certain decision-rules, the models can be systematically applied and can be used to compute the intrinsic value of any stock, whether they pay dividends or not.

- The models can help investors remain focused on dividend paying stocks. Dividend paying stocks have consistently been shown to outperform non-dividend paying stocks.
- Dividend discount models are grounded in indisputable theory. The logic is clear. When an investor buys a share of a business, they are basically paying a price today entitling them to enjoy the benefits of all the dividends that the company will pay.
- There is less subjectivity in the models as dividends tend to stay consistent over long periods of time. Companies experience a lot of volatility in measures like earnings and free cash flow. However, companies usually ensure that dividends are only paid out from cash which is expected to be present with the company every year. Further, there is no ambiguity regarding the definition of dividends. Whereas there is subjectivity as to what constitutes earnings and what constitutes free cash flow. This lack of subjectivity can make the models more reliable and hence more preferred.
- Dividend discount models are great for assessing mature businesses that pay regular dividends. Mature businesses are generally stable and are not expected to face much turbulence unless something drastic happens. This is important to many investors who prefer stability over the possibility of quick gains. Thus, from a valuation point of view, it is far easier to arrive at a discount rate. Since consistency eliminates risk, dividends are generally discounted at a lower rate as compared to other metrics that can be used in valuation.

### **Dividend & Quality Screens**

1. High Quality Businesses: When investing in any company, insist on businesses with a proven long-term record of stability, growth, and profitability. There is no reason to own anything but phenomenal businesses.
2. High Dividend Yields: Invest in businesses that pay high--but not too high--dividend yields. In most cases, the higher the yield, the higher your long-term return. Investors should also consider investing in businesses trading at valuation multiples that are trending below their long-term averages or forecasted equilibrium values. This will help to ensure that you don't overpay for any companies.
3. Dividend Safety: Invest in businesses whose future dividends are safe. These are business that pay out typically less than 80% of their earnings as dividends. If businesses are paying out all of their income as dividends, the odds are very high that the firm will need to cut its dividend in the future if there is a business downturn. And when a firm cuts its dividend, you can expect the stock price will soon fall too as a dividend cut is rarely seen as a good sign. Another indicator to assess is the firm's free-cash flow based payout ratio. Discrepancies sometimes exist between the earnings payout ratio and the free cash-flow payout ratio that can signal further concerns in the business.
4. Dividend Growth: Invest in businesses that have a long history of stable and growing dividends. A healthy track record in our opinion is a company that has raised its dividend steadily for at least 10 years with no interruptions. If a business has maintained a high dividend growth rate for several years, they are likely to continue to do so provided the business continues to grow and the dividends remain safe.
5. Recession-Proof Business: If possible, try to invest in businesses that are largely recession-proof. Sales, earnings and cash-flows from these businesses will remain relatively stable and will support stock price stability over the long-term.

Following these dividend screens will help investors to focus on only the best and safest dividend paying stocks for long-term investment success. Most of these screening criteria are generally accepted and applied by the world's top dividend investing gurus. They are also supported by much of the academic research.

## **Pricing a Company's Stock**

Pricing a company's stock using the SEENSCO dividend discount model involves first estimating 10 year forward earnings per share and then applying a payout ratio to projected earnings to determine the future dividend stream. A terminal value of the company is determined by assigning an equilibrium P/E ratio to the expected earnings at year 10. The terminal value and dividend stream are then discounted by the effective bond yield on the company's debt, scaled by a multiplier reflecting the stock's equity risk premium, to arrive at the current fair value of the company. Adjusting this fair value by the normal trading range of the company's stock gives the stock's fair value range. Stocks trading sufficiently below the lower bound of the fair value range will qualify for investment while stocks trading sufficiently above the upper bound of the fair value range will qualify for sale.

### ***EPS Estimation***

Earnings per share estimates for the first 2 to 3 years of the investment horizon are calibrated to consensus market estimates. After the consensus forecast period, EPS are projected forward based on the 10 year average nominal incremental change in EPS from the preceding 10 year period.

### ***Dividend Estimation***

Dividends are estimated by first determining a projected payout ratio (i.e. the percentage of the company's earnings paid out as dividends). Payout ratios for the first 2 to 3 years of the investment horizon are calibrated to consensus market dividend and earnings estimates, when available. The average payout ratio over the consensus forecast period is then applied against projected earnings for the remaining years of the forecast horizon. When consensus dividend and earnings estimates are not available, historical payout ratios are regressed against historical earnings per share data and are used to determine the forecasted dividend stream.

### ***P/E Multiplier Determination***

The price that a stock is expected to trade at the end of the holding period will have a significant impact on the price of the stock today. Usually companies with significant growth potential, stable earnings streams, and low risk will sell at higher P/E multiples compared to lower growth, unstable and/or higher risk companies. For determining an equilibrium P/E multiple, we run an optimization procedure that determines which P/E multiple yielded the best forecasting accuracy over the evaluation period. If in our judgment this multiple continues to accurately portray the earnings and cash-generating power of the company as well as the growth and risk characteristics of the firm, then we will use this multiple as our target multiple. If not, we will adjust the multiple upward or downward accordingly.

### ***Discount Rate Determination***

The most common approach used to estimate discount rates is the Capital Asset Pricing Model (CAPM). Based on this model, discount rates are a linear function of the risk free long term interest rate and a company specific Beta. Beta measures the covariability between the stock's return and a market index return. SEENSCO applies a different approach, which we have found yields superior results. That is, we estimate the discount rate as the average effective bond yield on the company's debt plus an equity risk premium. In our experience, the effective yield on the company's debt incorporates the market's assessment of the company's interest rate risk as well as its assessment of the default risk inherent in the company's operations, which we consider more reflective of true risk than market-based variability indicators. The equity risk premium component of the estimate is calculated by reverse engineering a multiplier of the firm's effective bond yield based on the company's historical trading price and the company's 1-year, 3-year, 5-year, or 10-year moving average earnings per share. For companies with no debt, the discount rate and equity risk premiums are calculated as a multiple of the long-term government bond rate instead of the firm's effective bond yield.

## Setting a Valuation Range

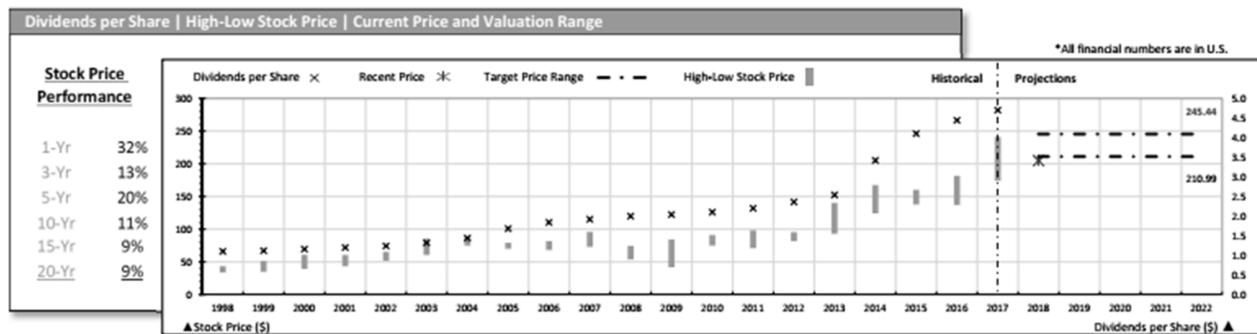
Setting an appropriate valuation range is important because it facilitates the comparison of the company's current stock price and return potential and tells investors whether it's a good time to buy or sell. The upper part of the valuation range signals degrees of overvaluation while the lower part signals degrees of undervaluation, and this is where investors should look for buy opportunities. To determine the valuation range, SEENSCO bounds the price target by the 10-year average stock price trading range, representing the stock's normal volatility. The span between the upper and lower valuation bounds represent the stock's fair value range and indicates where you can expect the stock to trade fairly given the company's earnings, dividends, and discounted terminal value.

## Application

As an example, presented below is a valuation of the 3M Co. 3M Co is a diversified technology company that manufactures various industrial and consumer products for the Industrial, Safety and Graphics, Health Care, Electronics and Energy, and Consumer industries. The company is best known for popular consumer products such as Scotch tape and Post-it Notes. The company's portfolio also offers display films, personal respirators, heavy-duty adhesives, reflective sheeting, sanding wheels, and filters. At the present time, 3M is trading at about \$208.60. Earnings per share are projected to rise from the current level of \$7.90 to \$13.40 over the next 10 years. The firm's dividend payout ratio is expected to hold steady at about 53% over the period. This results in a dividend stream rising from \$5.40 to \$7.10.

Discounting these dividends at the forecasted discount rate of 4.3%, reflecting an effective bond yield of 2.4% and an equity risk premium of 1.9%, results in a discounted dividend stream of \$51.26. Adding these to our discounted terminal value of \$176.96 results in a fair value estimate of \$228.22 and a valuation range of \$210.45 to \$245.44. The figure above presents 3M's historical price series as well as our target price estimate and forecasted fair value range. Based on the model results, 3M is given a stock rating of "ACCUMULATE".

Figure: 3M Co Dividends, High-Low Stock Price, Recent Price & Fair Value Range



## Model Recommendations

Model recommendations are guideposts to a broad audience and individuals must consider their own specific investment goals, risk tolerance, tax situation, time horizon, income needs, and complete investment portfolio, among other factors in making investment decisions.

**BUY:** The stock is trading significantly below the lower bound of the company's fair value range:  $\text{Price} < (\text{Target Price} - 1.5x \text{ average annual trading range})$ . Analysis suggests that based on the company's projected dividends and terminal value, the current market price will rise to substantially higher valuation levels.

**ACCUMULATE:** The stock is trading modestly below the lower bound of the company's fair value range:  $\text{Price} < (\text{Target Price} - 0.5x \text{ average annual trading range})$  "but"  $\text{Price} > (\text{Target Price} - 1.5x \text{ average annual trading range})$ . Analysis suggests that based on the

company's projected dividends and terminal value, the current market price will rise to modestly higher valuation levels.

**HOLD:** The stock is trading within the lower bound and upper bound of the company's fair value range:  $(\text{Target Price} - 0.5x \text{ average annual trading range}) < \text{Price} < (\text{Target Price} + 0.5x \text{ average annual trading range})$ . Analysis suggests that based on the company's projected dividends and terminal value, the current market price will gravitate towards the target price and fluctuate between the upper and lower valuation bounds.

**REDUCE:** The stock is trading modestly above the upper bound of the company's fair value range:  $\text{Price} > (\text{Target Price} + 0.5x \text{ average annual trading range})$  "but"  $\text{Price} < (\text{Target Price} + 1.5x \text{ average annual trading range})$ . Analysis suggests that based on the company's projected dividends and terminal value, the current market price will fall to modestly lower valuation levels.

**SELL:** The stock is trading significantly above the upper bound of the company's fair value range:  $\text{Price} > (\text{Target Price} + 1.5x \text{ average annual trading range})$ . Analysis suggests that based on the company's projected dividends and terminal value, the current market price will fall to substantially lower valuation levels.

**INCALCULABLE:** A target price, and hence, a fair value range for the company's stock cannot be calculated. This is generally due to negative projected future earnings.



# Sample Value Sheet

**A Model Recommendation**  
Indicates whether the firm is significantly undervalued, modestly undervalued, fairly valued, modestly overvalued, or significantly overvalued based on the dividend discount methodology.

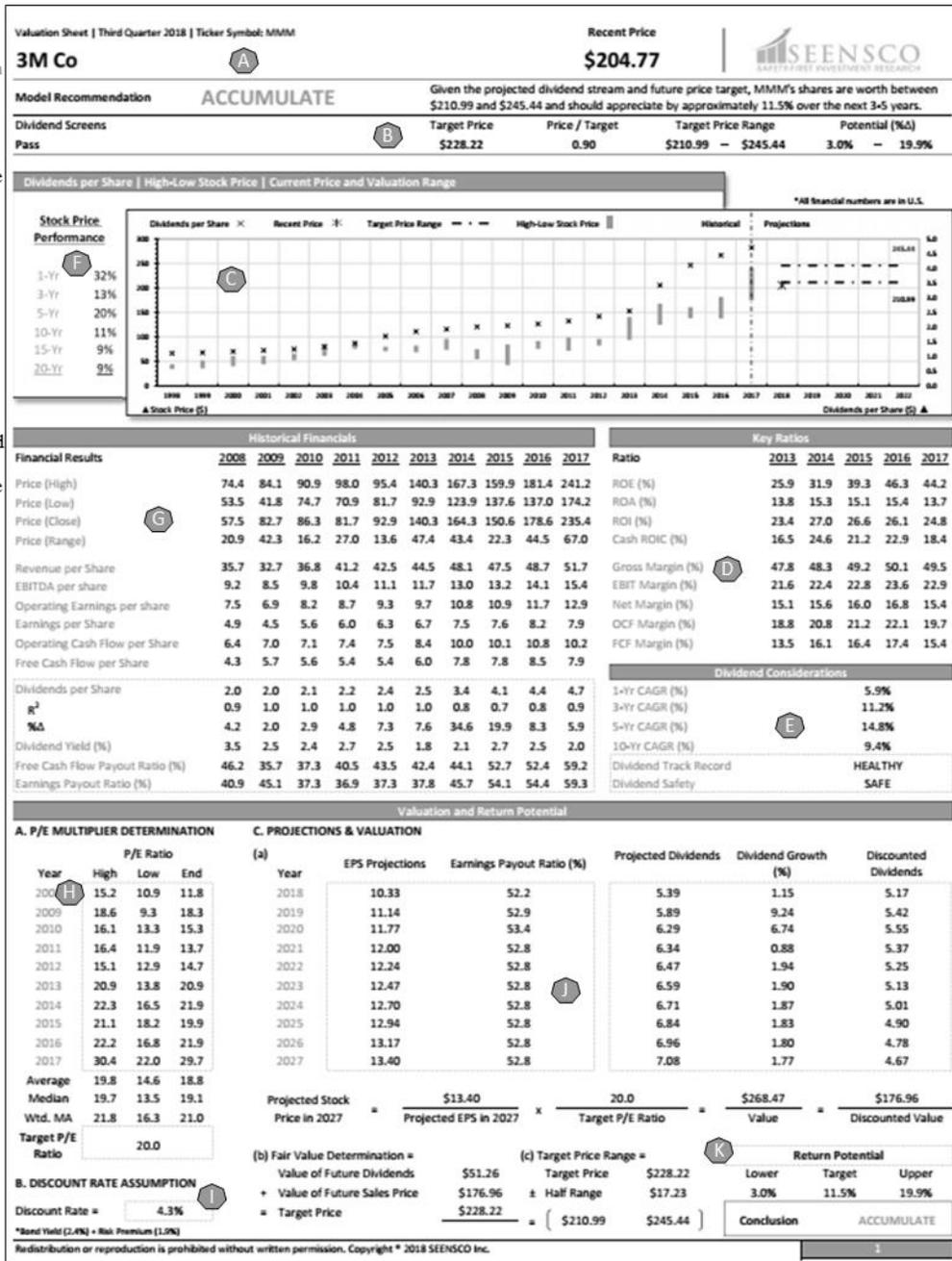
**B Target Price**  
Shows the company's target price and target price range derived based on the dividend discount methodology.

**C Historical dividends, High-Low Stock Price, Current Price and Target Price Range**  
Displays the historical price action and dividend stream. Also shows the current stock price in relation to the estimated fair value range for the company's stock.

**F Price Action**  
Shows the company's historical stock price performance over different periods of time.

**G Financial Summary**  
A summary of the financial and dividend performance of the company over the previous 10 year period.

**H Historical and Target P/E Multiplier**  
Shows the historical P/E multiplier as well as the average, median and weighted moving average multiplier over the previous 10 year period. Also highlights the P/E multiplier targeted using SEENSCO's proprietary optimization



**D Key Financial Ratios**  
Summary of key financial ratios and metrics that should be considered by all investors in assessing the competitive strength of the firm. Company's with higher margins and returns are typically competitively stronger firms.

**E Dividend Growth and Quality Screens**  
Summary of the firm's dividend growth performance. SEENSCO considers a firm's dividend track record as HEALTHY if it has provided positive and growing dividends for the last 10 consecutive years. Firms receive a SAFE dividend safety rating if their earnings-based payout ratios are below 80%.

**I Discount Rate Assumption**  
Shows the discount rate assumption equal to the effective bond yield on the company's debt plus an equity risk premium derived based on the company's historical trading price and moving average EPS.

**J Key Estimates**  
Summary of the market's consensus EPS estimates for the first 2 to 3 years, projected earnings estimates outside of the consensus forecast range, and the assumed payout ratio and discounted dividend stream.

**K Valuation and Return Potential**  
Shows the calculation underlying the firm's price target, fair value range, and return potential corresponding to each price estimate.