Implied Growth Tutorial
Introduction
by Jay Berry
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Implied Growth is not a concept endorsed in the NAIC's Official Guide. However, it may be a useful tool when applying judgment to filling out the front (visual analysis) of an NAIC Stock Selection Guide form.

Implied Growth is not a new concept. It has been described in security analysis textbooks for many years, but the descriptions are usually brief. Even though it is not a subject included in the NAIC's Official Guide, Implied Growth has been referenced and used in a number of Ralph L. Seger Jr.'s "Repair Shop" columns in *Better Investing (BI)* magazine. Those who have back issues of *BI* may gain additional insight by re-reading the "Repair Shop" articles in the July 1992, April 1993, November 1993, January 1995 and June 1996 issues.

Implied Growth is known by several other names. These include **Implicit Growth**, **Internal Growth**, **Sustainable Growth**, **% Retained Earnings to Common Equity**, **Plowback Ratio** and probably others. All of the preceding names refer to the same thing. Different authors use different terminology. Perhaps they are trying to pick a name that, in their opinion, best conveys what Implied Growth means. The name Sustainable Growth conveys the meaning that the projected growth can be maintained over a long period of time.

The decision to use the name Implied Growth in this article was based on two factors. First, the "Repair Shop" columns seem to use this name the most often. Second, several NAIC approved software products from STB use this name -- Prospector in the Growth category and Stock Analyst (SA) at the bottom of the Balance Sheet display.

This tutorial covers the following topics.

- Definition: Describe how Implied Growth is calculated and what it means.
- Sources: Describe how Implied Growth can be determined from a Stock Selection Guide or from Value Line.
- SSG: Describe the characteristics of a Stock Selection Guide for a company that closely approximates the assumptions and constraints of Implied Growth.
- Assumptions: Describe and interpret the key assumptions and constraints that apply to the use of Implied Growth.
- Case Studies: Present examples of how Implied Growth might be used.

Implied Growth Tutorial
Sources

How can Implied Growth be determined from a Stock Selection Guide (SSG) or from a *Value Line* sheet?

When working with a completed SSG, the Implied Growth rate for each of the most recent 5 years of data (in Sections 2 and 3) can be calculated as follows:

$$\text{Implied Growth} = (\text{Row 2B}) \times (1 - \frac{\text{Column 3G}}{100}) \text{ for each year}$$

Judgment still needs to be applied to determine if the historical Implied Growth values are relatively constant, or if a trend is present that may apply to projected growth.

Value Line provides yearly values for Implied Growth. *Value Line* calls this quantity "% Retained to Comm Eq." It is the next to last row in the main data table.

How do the STB software programs Prospector, SSGc and Stock Analyst calculate Implied Growth?

Prospector, SSGc and Stock Analyst all calculate and display a value for Implied Growth. It is obtained by using the "Last 5 Year Avg" of the % Earned on Equity (at the end of Row 2B) and the 5 year average of the % Payout (Row 7 of Column 3G).

Implied Growth Tutorial
and the Stock Selection Guide

What are the characteristics of a Stock Selection Guide (SSG) for a company that closely approximates the assumptions and constraints of Implied Growth?

Ideally the plots of sales, earnings per share and pre-tax profit on the front of an SSG would be on straight lines that all have the same slope. This slope would have the same value as the Implied Growth calculated from the data in Sections 2 and 3 of the SSG. Keep in mind that calculated historical Implied Growth pertains to the ability of present or past management. Future Implied Growth could change if there is a change in management.

In practice, look for cases where the data points are almost on straight lines and the slopes are almost the same.

So "What's new?" you might ask. This is what NAIC has been advocating for almost 50 years. That is: look for companies that have demonstrated steady growth and have Pre-tax Profit Margins and % Earned on Equity that are almost constant or slowly increasing. The only thing that has been added so far is a suggestion to compare the calculated Implied Growth with the historical growth as an aid for projecting future growth.

The following two characteristics extend slightly beyond the information on a standard SSG.

- The ratio of debt to equity should also be (almost) constant. See the first sentence of Higgins' definition. For Stock Analyst users, this ratio is shown on Row 2C. For Value Line users, the ratio can be obtained by dividing Long Term Debt by Net Worth.

- The number of common shares should be (almost) constant. See the second sentence of Higgins' definition. Value Line users should look at Common Shs Outst'g.

Implied Growth Tutorial
Assumptions

What are some of the key assumptions and constraints that apply to the use of Implied Growth?

In order for Implied Growth to be a useful tool, it is helpful to better understand what assumptions and constraints apply to its use. This enables users to analyze and understand why a specific company's historical growth may have differed from the calculated value of Implied Growth. This understanding can be a useful basis for projecting future growth.

Implied growth was previously defined as:

Equation 1

Implied Growth = (% Return On Equity) x (1 - Dividend Payout Ratio)

An equivalent expression that is useful for working through a hypothetical example of Implied Growth is:

Equation 2

$$\text{Implied Growth} = \frac{(\text{Net Profit} - \text{Dividends})}{\text{Equity}} \times 100 \text{ percent}$$

(Net Profit - Dividends) is commonly called Retained Earnings or Reinvested Earnings. Equation 2 draws attention to the role of Retained Earnings as a driver for a high Implied Growth value.

Equity is the amount of money that common shareholders have invested in the company. For the purposes of this article it is convenient to think of Equity as the money that the company initially received from the sale of shares to the public plus the cumulative sum of all retained earnings that have been kept by the company. For a company that is profitable and does not pay out all of its earnings as dividends, Equity will increase every year. In this context Implied Growth is the rate that new Retained Earnings cause Equity to increase.

The Higgins' definition can be paraphrased to obtain the following three key assumptions/constraints that apply to Implied Growth:

1. All financial ratios remain constant from year to year.
2. Sales growth requires a corresponding growth in assets (constant assets to sales ratio).
3. Retained Earnings is the only source of funds used to increase common equity (no new shares of stock are sold).

Assume that during a fiscal year, a company earns a profit. At the end of the year the portion of this profit that is not paid out as dividends (retained earnings) is added to shareholders' equity. Therefore, the equity is increased by some percentage. Initially this causes some of the financial ratios to change (any ratio that has equity in its numerator or denominator). The only way to bring all of the balance sheet related ratios (such as debt to equity for example) back to their previous values is to increase every item in the balance sheet by the

same percentage (increase debt by the same percentage that equity increased, etc.).

This causes total assets (consisting of plants, equipment, inventory, etc.) and total liabilities (consisting of equity, long term debt and current liabilities) to increase by the same percentage that equity increased. (The model defines what needs to be done, not how it is to be accomplished.)

Then, in order for the profitability ratios (such as the net profit to assets ratio) to remain constant next year, sales and earnings will have to increase by the same percentage that assets have increased. The net effect is that assets, sales and earnings all increase by an amount equal to the calculated value of Implied Growth.

Implied Growth is based on the assumption that the above process will be repeated every year.

Do not expect that most companies will meet all of the exact assumptions and constraints imposed by the basic Implied Growth model. However, a company that has closely approximated the model in the past provides some confidence that historical growth will continue. Conversely, the more a company deviates from the model, the more likely that future growth could be different from historical growth.

At this point it is reasonable to ask about the best ways to use Implied Growth. There is no simple, concise answer. From one point of view, the model has been useful as a reminder that growth in sales, earnings and assets do not occur independently. This should cause investigation into how a company is financing the acquisition of additional assets when sales growth exceeds the Implied Growth rate.

What does it mean if a company's historical growth has been significantly different than its Implied Growth would predict?

There are several ways a company can increase assets faster than retained earnings are growing. If a company is growing with a high growth rate relative to its Implied Growth, check to see if long term debt is being increased faster than equity and/or if the number of shares outstanding is being increased to fund unsustainable growth. If debt is growing faster than equity, then risk is increasing. At some point the company will not be able to borrow more money to finance its growth.

Also, look at pre-tax profit margin; management may have found a way to increase margins.

Sometimes the answer to how a company is funding a high growth rate is obvious. Other times it is not.

There are also cases where a company is very profitable and uses part of the profit to decrease debt and/or buy back shares. This will cause the growth of assets to be less than the Implied Growth rate. However, note that a long term share buy back program can result in a situation where the earnings per share growth rate will consistently exceed the sales growth rate for many years.

Implied Growth is a very useful starting point to understand how a company has been financing its growth. Judgment can then be utilized to project future growth. Keep in mind that Implied Growth is a tool to help make rational judgments. It is not a cook book method to replace judgment.

The results of all management actions are shown by the four basic tests of the Stock Selection Guide (see the NAIC Official Guide, page 65):

1. Sales growth
2. Earnings growth
3. Steady or increasing pre-tax profit margins
4. Steady or increasing earnings on invested capital

Implied Growth Tutorial
Case Studies

How does Implied Growth apply to some actual companies?

Four examples are provided.

1. **Sigma-Aldrich (NASDAQ: SIAL)** is an example of a company that has most of the characteristics of an idealized Implied Growth situation. SIAL was the Stock to Study in the October 1996 issue of *Better Investing* magazine.
2. **Coca-Cola (NYSE: KO)** is an example of a very profitable company that has been buying back shares and has had a sales growth that is less than its Implied Growth.
3. **Atmel (NASDAQ: ATML)** is an example of a company that has been growing at a rate much higher than its Implied Growth. ATML was the NAIC Growth Stock of the Year for 1996.
4. **FPL Group (NYSE: FPL)** is an example of a company that distributes a majority of its earnings as dividends. Its Implied Growth and actual growth have been low. FPL was selected only because it happened to be at the bottom of a list that ranked companies in an investment club portfolio in order of their Implied Growth in 1991. (See *Better Investing* April 1993 page 18.)

All four examples use the August 1996 NAIC S&P Datafiles for input data. The data shown for Sections 2 and 3 of each SSG were obtained using Toolkit. Value Line covers all four companies. An SSG prepared using Value Line data should show similar, but not identical, results.

The examples are not intended to be a complete analysis of any of the companies. They are intended to illustrate some interesting and useful aspects of Implied Growth.

Hopefully, if time is taken to work through the details, the examples will help develop insight that will be useful for projecting future growth for a wide range of companies.

Concluding Comments

There are many factors that influence the growth of a company. Implied Growth can be a very useful tool when projecting future growth. However, a calculated Implied Growth value should not be used indiscriminately. It is important to understand the assumptions that are embedded in a calculated value of Implied Growth. This understanding enables a user to evaluate how historical growth was funded and to look for trends that may extend into the future. Implied Growth is a tool to help refine judgment. It does not replace judgment.