

Benjamin Graham Revisited

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Introduction

Warren Buffett read the first edition of Benjamin Graham's book, *The Intelligent Investor*, in 1950. According to Buffett (Graham, Revised, 2003) "I thought then that it was by far the best book about investing ever written. I still think it is."

Chapter 14, Stock Selection for the Defensive Investor, lists seven criteria that the defensive investor should use to select common stocks. Can a buy and hold defensive investor use this stock selection criteria and earn a positive abnormal risk adjusted rate of return?

To test this hypothesis data for 2000 and prior years are used to select stocks that meet the defensive investor criteria. Nine stocks from an original list of more than 9,000 satisfy the criteria. Buy and hold is the investment strategy and these stocks are held from the end of June 2001 until the end of December 2007. The performance measure is the time-series regression intercept, or alpha, for the four-factor model. The estimated alpha is negative but not statistically significant.

Literature Review

A study by Oppenheimer and Schlarbaum (1981) is the only study that we could find that is similar to our study. They used the following criteria to select stocks: 1) \$50 million in assets or annual sales and be in upper ¼ to 1/3 of its industry in size; 2) Equity (at book value) at least 50 percent of total capitalization for industrial companies; at least 30 percent of total capitalization for utilities; 3) Stock price not to exceed 25 times average earnings of past seven years and not to

exceed 20 times earnings of latest twelve month period. The study covered the time period from the end of December 1955 through December 1975 and the portfolio of stocks was revised each year. Jensen's alpha was the performance measure. The alpha values reported are positive but no measures of statistical significance such as p-values or t-values are reported.

Graham's Defensive Investment Criteria

Graham discussed seven historic investment criteria. They vary from a minimum size criteria to a price to assets ratio criteria.

The first is an adequate size of the enterprise: According to Graham the size of the firm is an indirect measure of safety. A smaller company is generally subject to wider fluctuations in earnings. In 1970 Graham recommended that an industrial company should have at least \$100 million of annual sales, and a public utility company should have no less than \$50 million in total assets. Adjusted for inflation, the numbers in 2000 would work out to approximately \$465 million and \$232 million respectively. Financial firms are not considered.

The next is a sufficiently strong financial condition. A stock should have a current ratio of at least two and long-term debt should not exceed working capital. For utilities, the debt should not exceed twice the stock equity at book value. This should act as a strong buffer against the possibility of bankruptcy or default.

Then is an earnings stability criteria. The company should not have reported a loss over the past 10 years. Companies that maintain at least some level of earnings are, on the whole, more stable.

There is a dividend record criteria. Company should have a history of paying dividends on its common stock for at least the past 20 years. This should provide some assurance that future dividends are likely to be paid.

Related to the dividend criteria is an earnings growth criteria. To help ensure a company's profits keep pace with inflation, net income should have increased by one-third or greater on a per-share basis over course of the past 10 years using three-year averages at the beginning and end.

There is also a price to earnings ratio criteria. For inclusion into a conservative buy and hold portfolio, the current price of a stock should not exceed fifteen times its average earnings for the past three years. This acts as a safeguard against overpaying for a security.

The last criteria is the Ratio of Price to Assets. According to this criteria current price should not be more than 1 1/2 times the book value last reported. However, a multiplier of earnings below 15 could justify a correspondingly higher multiplier of assets. As a rule of thumb the product of the multiplier times the ratio of price to book value should not exceed 22.5 (this corresponds to 15 times earnings and 1 1/2 times book value. It would admit an issue selling at only 9 times earnings and 2.5 times asset value, etc.)

Data and Performance Measure

The information used to select the firms that satisfy the above criteria was from Standard & Poor's Compustat. This data is for 2000 and earlier years. The monthly closing stock prices for the selected firms, which are used to calculate monthly portfolio rates of return, are from the end of June 2001 through the end of December 2007 and are from Yahoo Finance. These stock prices are adjusted for cash dividends and stock splits. The non-stock performance measurement data, such as the risk free rate and market rate of return, is from the Kenneth French's web site (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html). The market proxy is the monthly rate of return on the value weighted CRSP (Center for Returns in Security Prices) with dividends.

The four-factor regression model (Fama and French, 1993, and Carhart, 1997) is used to measure performance. The mathematical form is

$$R_t - RF_t = \alpha + \beta_1 * RMRF_t + \beta_2 * SMB_t + \beta_3 * HML_t + \beta_4 * Momentum_t + \varepsilon_t$$

where

R_t is the rate of return in month t on the Graham portfolio,

RF_t is the rate of return in month t for the risk free proxy,

$RMRF_t$ is the rate of return in month t for value-weighted market index minus the risk-free proxy,

SMB_t is the small minus big proxy (size effect),

HML_t is the high minus low proxy (book-to-market effect), and

$Momentum_t$ is the momentum proxy.

The dependent variable is monthly rate return for the selected stock portfolio minus the monthly risk free rate. The four independent variables are:

1. Excess return on the value weighted market portfolio (Rate of Return on the value weighted CRSP index with dividends minus the risk free proxy);
2. Difference between the returns of value weighted portfolios of small and big firm stocks;
3. Difference in returns of value weighted portfolios of high and low book-to-market stocks; and
4. Difference in returns of stocks with high past returns minus those with low past returns (Momentum).

The estimated y-intercept or alpha is interpreted as the mean monthly abnormal return.

Results

Table 1 contains the names of the nine firms that meet Graham's investment criteria.

1	AAR Corp
2	Avnet
3	Circuit City Stores
4	Haverty Furniture
5	La-Z-Boy
6	Nucor
7	Oxford Industries
8	Watsco
9	Werner Enterprises

The portfolio starts with an equal investment in each security and presumes a buy and hold strategy. That is, there is no monthly portfolio re-balancing.

Figure 1 shows the value a \$10,000 investment in the Graham portfolio and the Standard and Poor's 500 index (including dividend re-investment). The Graham portfolio grows from \$10,00 to \$19,679 (from the end of June 2001 to the end of December 2007) whereas the Standard & Poor's 500 index goes from \$10,000 to \$13,453.

The four-factor model's estimated intercept (alpha) is -0.061% per month, which is equivalent to -0.735 percent per year. The negative value is not statistically significant. The one tail t statistic for the null hypothesis that the population intercept or alpha is greater than zero is -0.84.

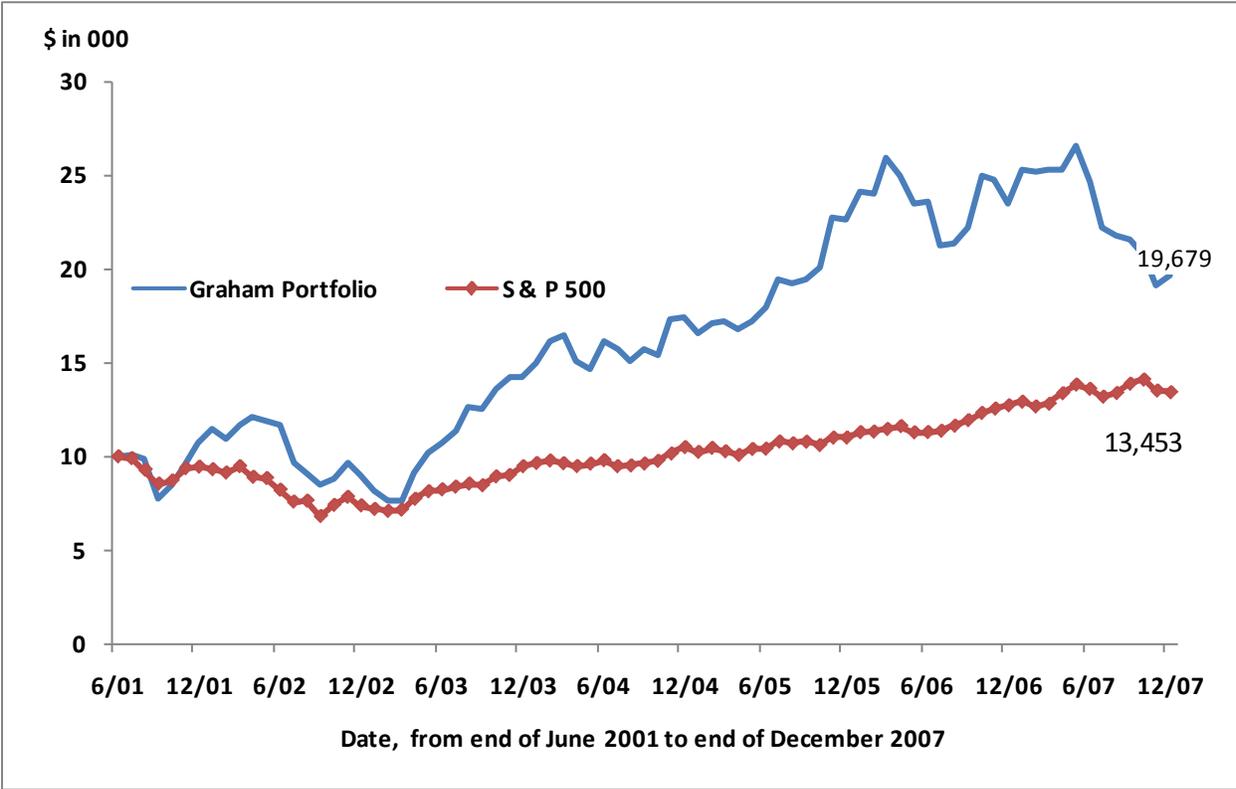
Additionally, the r-square for the regression of the 36 monthly rates of return for the nine stock portfolio for three years prior to 2001 against the corresponding monthly rates of return on the Standard and Poor's 500 index was 0.55. This indicates that the nine stock portfolio was not fully diversified.

Summary

The buy and hold portfolio selected using Graham's defensive investor criteria held only nine stocks. Using the four-factor model the calculated alpha for this portfolio was negative but not statistically significant. These results imply that information such as Graham's defensive investment criteria are reflected in the current price of a stock. As a result, abnormal rates of return would occur only randomly.

As mentioned above the results presented here are preliminary. Future research should use the seven criteria to rebalance the stock portfolio annually.

Figure 1: Value of \$10,000 investment in Graham Portfolio and S&P 500 Index



References

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