Testing some of Benjamin Graham's Stock Selection Criteria: A Case of the FTSE Bursa Malaysia EMAS Index from Year 2000 to 2009

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ABSTRACT

Benjamin Graham, also known as the "father of value investing" proposed that investment in the stock exchange can be a safe endeavor while receiving gains that outperform the market if the investor makes carefully thought out purchases. This study aims to determine if the use of some of Benjamin Graham's stock selection criteria is able to generate returns that are significantly greater than the returns in the stock exchange of Malaysia, particularly, the comprehensive FTSE Bursa Malaysia EMAS Index. This study collected secondary data regarding fundamentals of companies listed in the FTSE Bursa Malaysia EMAS Index from the year 2000 to 2009. Five criteria were set up in this research based on one or a combination of price-to-earnings ratio, price-to-book value, current ratio and dividend yield. The listed companies were screened using those criteria. An equally weighted portfolio was created using the screened companies and their one-year and two-year returns calculated. The returns were compared to the market return. Hypotheses of this research were tested using t-test statistic to determine the significance of the data. This research found that most of the screening criteria used generated returns that were higher than the market return in almost every year they were tested in. Benjamin Graham's stock selection criteria although have been conceived over 80 years ago is still applicable today in the Malaysian market. Further research can be conducted with different criteria with varying holding periods and in different markets.

Keywords: Benjamin Graham, value investing, stock market, stock return, price-to-earnings ratio, price-to-book value, current ratio, dividend yield

INTRODUCTION

According to Kahn & Milne (1997) investment activities in the early 1900s were limited to bonds as their returns are clearly stated. Without any guarantee of returns, common stocks were perceived as speculations.

As the father of fundamental analysis, Benjamin Graham believed that stock markets are not efficient. Graham & Zweig (2003) proposed that not overpaying for a stock is one of the safest methods one can use in investments. Therefore, excess returns can be had without significant risks through an investment paradigm called value investing.

Value investing as defined by Graham & Zweig (2003) is based on three characteristics of the financial markets. Firstly, the prices of financial securities are subject to erratic and significant movements. Secondly, despite these erratic movements, financial securities have fairly stable underlying values. These fundamental economic values can be measured by the investor who uses due diligence. In short, the value of the security may not be reflected in its current market price. Finally, the time to buy financial securities is when they are selling significantly below their intrinsic value or what they are really worth based on assets of the company. Buying financial securities that have a market price below their intrinsic value provides safety for the value investor in the form of not over-paying for what those securities are worth.

In Graham & Zweig's (2003) "The Intelligent Investor", Graham outlined seven criteria for the defensive investor who seeks safety issues and does not actively monitor stock prices. The seven criteria are as follows:
1. Sufficient size of enterprise
2. An adequately strong financial condition
3. Earnings stability
4. Dividend record
5. Earnings growth
6. Moderate price-to-earnings ratio
7. Moderate ratio of price to assets

The first three criteria are representative of the strength of a company while the next four are representative of what returns can be expected from it.

Oppenheimer (1984) suggested that a screening rule that contains a combination of criteria can be used to reap different returns. Having more or less criteria does not necessarily give higher or lower returns. Instead, the researcher needs to find the best combination that produces the highest return. Researches by Fama& French (1998), and Xiao &

Arnold (2008) also found that investments based on a combination of value investing principles tend to outperform the market.

A low price-to-earnings ratio is an important criterion to use for the identification of a value stock. The ability of this criterion to generate returns that are higher than the market return is supported by the works of Basu (1977, 1983); Chan *et al.*(1991); Fama& French (1992);Athanassakos (2009);Truong (2009). Purchasing a stock with low price-to-earnings ratio can safeguard the investor from paying too much for a unit of earnings that the company generated.

Another criterion that determines a company's value is price-to-book value. A price-to-book value of 1 would mean that the investor is just paying for the book value per share of the company. Therefore, this reduces risk to the investor for not paying for intangibles that cannot be accurately determined. Chan*et al.*(1991); Davis (1994); Piotroski (2000); Fama& French (2006); Athanassakos (2009); Dempsey (2010) found that common stocks with low price-to-book value earn higher returns.

Graham & Zweig (2003) believed that a company that constantly pays dividend is a safe investment. Lamont (1998) found that high dividend payout ratio can be used to forecast high returns.

Purchase of growth stocks is also known as glamour investing. Lakonishok*et al.* (1994) believed that investors tend to extrapolate earnings of companies too far into the future. Investors are willing to pay a high price in relation to earnings per share supported by a strong earnings forecast and bright growth outlook. This results in a high price-to-earnings ratio for growth stocks. As a form of contrarian investment that is contrary to growth investing, Fama& French (1998); Kwag& Lee (2006) also found that value investing tend to outperform growth investing.

Value investing criteria alone are not sufficient to select value stocks. The final element to value investing is the holding period. As the vicissitudes of stock prices have minimal effect on value investing, a long holding period works in favor of value investing. Works of Lakonishok*et al.* (1994); Rousseau &Rensburg (2004) support the fact that returns from value investing increases with an increase in holding period.

RESEARCH METHODOLOGY

Screening Rules

This research uses five screening rules to filter in stocks that meet value investing criteria defined in this study. The main objective of this study is to determine if the use of some of Benjamin Graham's stock selection criteria on their own can produce returns that are greater than the market return. The second objective is to compare if the use of a combination of Benjamin Graham's stock selection criteria can produce returns that are greater than using them alone.

As not all criteria can be practically implemented to select stocks in a low maturity market such as the stock exchange of Malaysia, one of the criteria was modified to suit the FTSE Bursa Malaysia EMAS. The criterion that a company should have a constant dividend yield was modified to become a dividend yield of at least the risk-free rate of the year in question. The reason for selecting the risk-free rate to compare with dividend yield is that even if the long term defensive investor cannot reap returns from stock price appreciation, he/she can still get a dividend that is at least the risk-free rate. This way, the investor does not lose out to risk-free investments like saving money in the bank. Unlike putting money in a savings account to get a fixed risk-free return, the defensive investor took risk to invest in the stock market but still obtained risk-free return with a potential for higher returns.

The following are screening rules that uses some of Benjamin Graham's stock selection criteria individually and as a combination.
1. Price-to-earnings ratio of not more than 15.
2. Price-to-book value of not more than 1.
3. Price-to-earnings ratio of not more than 15, price-to-book value of not more than 1, and current ratio of at least 2.
4. Price-to-earnings ratio of not more than 15, price-to-book value of not more than 1, and dividend yield of at least the risk-free rate.
5. Price-to-earnings ratio of not more than 15, price-to-book value of not more than 1, current ratio of at least 2, and dividend yield of at least the risk-free rate.

Research Data and Portfolio Construction

The dividend yield data was compared to risk-free rate of the country which was obtained from Bank Negara Malaysia or the Central Bank of Malaysia. The figures used were the shortest risk-free rate of the country at the end of each year, which were the overnight interbank rates.

All other financial data of companies listed in the FTSE Bursa Malaysia EMAS Index were obtained from Bloomberg through the use of a Bloomberg Professional terminal. The researcher obtained a list of companies in the FTSE Bursa Malaysia EMAS

Index that existed in each year from the year 2000 to 2009. All data were collected at the end of every year. Companies with incomplete data were ignored. These lists were then screened according to the screening rules outlined in this research.

Stocks that meet this research's screening rules were summed up to create an equally weighted portfolio for every rule. From the year 2000 to 2009, the researcher found between 11 and 238 stocks that meet the stock selection criteria which depends on the number of companies that were listed and the strictness of the criteria. The one-year returns of these five portfolios were calculated. Another five portfolios were created using the same screening rules. This time, the two-year returns were calculated. This process was repeated until the year 2009 where the one-year return was calculated as there is not enough data to calculate two-year returns for the year 2009 at the time this research was carried out.

To compute the total returns of the portfolios, the following formula was used:

$$\text{Total Return} = \frac{\text{Dividend paid} + \text{Capital Gain}}{\text{Beginning share price}} \quad (1)$$

where,

$$\text{Capital Gain} = \text{Last Price of the next year} - \text{Last Price of the current year} \quad (2)$$

To compute the one-year returns of the FTSE Bursa Malaysia EMAS Index, the following formula was used:

$$1 - \text{year return at year t}$$
$$= \frac{D_{t+1}}{P_t} + \frac{P_{t+1} - P_t}{P_t} \quad (3)$$

where,

D = dividend paid
P = price of stock at year end
t = current year

The two-year returns were calculated using the following formula:

$$2 - \text{year return at year t}$$
$$= \frac{D_{t+1} + D_{t+2}}{P_t} + \frac{P_{t+2} - P_t}{P_t} \quad (4)$$

where,

D = dividend paid
P = price of stock at year end
t = current year

Statistical Treatment of Data

Returns of the portfolios were compared to the returns of the market, namely, the FTSE Bursa Malaysia EMAS Index. This research will initially determine if the returns of the portfolios created from the screening criteria are higher than the market

return. If the returns are higher, their statistical significances were determined using t-test statistic. According to Walpole *et al.* (2002), a one-tailed t-test can be used to determine the statistical significance of hypotheses in this study.

In the case of hypothesis testing in the FTSEBM EMAS Index, since this research aims to test hypothesis on a single mean, the general detail of each hypothesis and its test equation are as follows:

Ho: Return of the portfolio is equal to or lower than the return of the market

Ha: Return of the portfolio is significantly higher than the return of the market

$$t - \text{statistic} = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{(n-1)}}} \quad (5)$$

where,

$\bar{x}$ = mean return of the sample
μ = mean return of the stock index
s = standard deviation of the sample
n = number of stocks in the sample

RESULTS AND DISCUSSIONS

In this part, the researcher discusses the main findings from the study. The detailed results can be found in Appendix.

For the first screening rule, the researcher found that the resultant portfolio produced significantly greater one-year returns than the market for 9 out of 10 years. The same screening rule produced significantly greater two-year returns than the market for 8 out of 9 years.

For the second screening rule, the researcher found that the resulting portfolio produced significantly higher one-year returns compared to the market for 9 out of 10 years. The same screening rule produced significantly higher two-year returns than the market for 8 out of 9 years.

Using the third screening rule, the researcher found that the resulting portfolio produced significantly higher one-year returns compared to the market for 8 out of 10 years. The same screening rule produced significantly higher two-year returns than the market for 7 out of 9 years.

When stocks were selected based on the fourth screening rule, the researcher found that the resulting portfolio produced significantly higher one-year returns compared to the market for 9 out of 10 years. The same screening rule produced significantly higher two-year returns than the market for 8 out of 9 years.

By combining all stock selection criteria in the fifth screening rule, the researcher found that the

resulting portfolio produced significantly higher one-year returns compared to the market for 7 out of 10 years. The same screening rule produced significantly higher two-year returns than the market for 6 out of 9 years.

Using some of Benjamin Graham's stock selection criteria as screening rule to select stocks to invest in, the researcher found that 79 out of 95 hypotheses generated significantly higher returns than the return of the FTSE Bursa Malaysia EMAS Index. Out of the 16 hypotheses that did not generate significantly higher returns than the market return, 15 hypotheses still generated higher returns than the market return. Only the two-year return in the year 2003 using criterion of a price-to-book value of not greater than one did not produce a return that is higher than the market return.

From this research, it can be seen that using some of Benjamin Graham's stock selection criteria on their own such as a low price-to-earnings ratio and a low price-to-book value is sufficient to generate returns that are greater than the market return. This is advantageous for defensive investors that can acquire basic company fundamentals. However, adding more criteria to generate stricter screening rules open up more possibilities for even higher returns. Similar to Oppenheimer's (1984) research, adding more criteria does not always produce higher returns.

CONCLUSIONS AND RECOMMENDATIONS

In this research, the highest returns came from the fourth screening rule which has a price-to-earnings ratio of not greater than 15, a price-to-book value of not greater than 1 and a dividend yield of at least the risk-free rate. This screening rule generated the highest returns from eleven out of nineteen portfolios created in this research. From this finding, it can be implied that investing based on this screening rule will generally provide returns that are higher than the return of the FTSE Bursa Malaysia EMAS Index.

In conclusion, evidence in this study suggests that Benjamin Graham's stock selection criteria were not without merit. They have provided returns that are not only greater than market returns, but significantly so.

The only portfolio that did not produce a return that was higher than the market return was created using the criterion of a low price-to-book value in the year 2003 to select stocks that were held for two years. This could be due to significant market forces reported by BBC (2003) that unsettled the economy so badly that government intervention was needed to stimulate the economy. Based on this fact, the researcher suggests that investors that do not intend to take unnecessary risks, to not invest in the stock market when the economy is turbulent. Otherwise, using some of Benjamin Graham's stock selection criteria still produced returns that are higher than the return of the FTSE Bursa Malaysia EMAS Index.

As this research can benefit private investors, fund managers and academicians, more research can be extended on this research. Due to the scope and limitations of this research, there may occur some shortcomings that do not allow the investor to get the maximum possible long-term return.

Future researches can use different combinations of Benjamin Graham's stock selection criteria to determine if greater returns can be found. Future researchers can fine-tune the screening criteria used in this research to obtain the maximum possible return from investing in the FTSE Bursa Malaysia EMAS Index.

As investors hope for better returns from the limited amount of capital they have, future researches can also be made on the percentage return of a portfolio using various screening criteria when compared to the market return. The ultimate aim would be to find the stock selection criteria that produce the maximum possible long-term return.

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Appendix:

Table 1. Results of one-year portfolios in the year 2000

| Screening Rule | Number of Stocks | 1-year return in year 2000 | | p-value | Significant |
		Market	Portfolio		
1	95	1.09%	14.75%	0.00001	Yes ***
2	76	1.09%	17.58%	0.00000	Yes ***
3	17	1.09%	20.10%	0.00545	Yes ***
4	26	1.09%	26.37%	0.00008	Yes ***
5	11	1.09%	26.02%	0.00990	Yes ***

*10% significance, **5% significance, ***1% significance.

Table 2. Results of two-year portfolios in the year 2000

| Screening Rule | Number of Stocks | 2-year return in 2000 | | p-value | Significant |
		Market	Portfolio		
1	95	-4.74%	22.94%	0.00006	Yes ***
2	76	-4.74%	20.87%	0.00250	Yes ***
3	17	-4.74%	43.02%	0.06054	Yes *
4	26	-4.74%	44.66%	0.01176	Yes **
5	11	-4.74%	62.64%	0.07964	Yes *

*10% significance, **5% significance, ***1% significance.

Table 3. Results of one-year portfolios in the year 2001

| Screening Rule | Number of Stocks | 1-year return in 2001 | | p-value | Significant |
		Market	Portfolio		
1	101	-5.77%	7.88%	0.00000	Yes ***
2	78	-5.77%	1.23%	0.00156	Yes ***
3	22	-5.77%	2.26%	0.02985	Yes **
4	28	-5.77%	8.19%	0.00022	Yes ***
5	15	-5.77%	4.86%	0.02510	Yes **

*10% significance, **5% significance, ***1% significance.

Table 4. Results of two-year portfolios in the year 2001

| Screening Rule | Number of Stocks | 2-year return in 2001 | | p-value | Significant |
		Market	Portfolio		
1	101	15.93%	50.45%	0.00000	Yes ***
2	78	15.93%	37.12%	0.00002	Yes ***
3	22	15.93%	47.98%	0.00170	Yes ***
4	28	15.93%	53.02%	0.00018	Yes ***
5	15	15.93%	51.60%	0.00879	Yes ***

*10% significance, **5% significance, ***1% significance.

Table 5. Results of one-year portfolios in the year 2002

| Screening Rule | Number of Stocks | 1-year return in 2002 | | p-value | Significant |
		Market	Portfolio		
1	145	23.03%	46.08%	0.00000	Yes ***
2	122	23.03%	41.70%	0.00000	Yes ***
3	41	23.03%	45.78%	0.00116	Yes ***
4	47	23.03%	45.83%	0.00072	Yes ***
5	30	23.03%	46.83%	0.00746	Yes ***

*10% significance, **5% significance, ***1% significance.

Table 6. Results of two-year portfolios in the year 2002

| Screening Rule | Number of Stocks | 2-year return in 2002 | | p-value | Significant |
		Market	Portfolio		
1	143	37.27%	69.24%	0.00000	Yes ***
2	122	37.27%	60.22%	0.00018	Yes ***
3	41	37.27%	64.87%	0.00320	Yes ***
4	47	37.27%	64.40%	0.00171	Yes ***
5	30	37.27%	72.08%	0.00514	Yes ***

*10% significance, **5% significance, ***1% significance.

Table 7. Results of one-year portfolios in the year 2003

Screening Rule	Number of Stocks	1-year return in 2003		p-value	Significant
		Market	Portfolio		
1	146	11.57%	20.82%	0.00513	Yes ***
2	98	11.57%	21.07%	0.03178	Yes **
3	26	11.57%	21.13%	0.11485	No
4	31	11.57%	19.06%	0.06868	Yes *
5	13	11.57%	19.15%	0.16369	No

*10% significance, **5% significance, ***1% significance.

Table 8. Results of two-year portfolios in the year 2003

Screening Rule	Number of Stocks	2-year return in 2003		p-value	Significant
		Market	Portfolio		
1	140	4.23%	8.14%	0.22644	No
2	91	4.23%	4.02%	0.51278	No
3	25	4.23%	5.12%	0.46349	No
4	31	4.23%	22.80%	0.16099	No
5	13	4.23%	10.00%	0.27154	No

*10% significance, **5% significance, ***1% significance.

Table 9. Results of one-year portfolios in the year 2004

Screening Rule	Number of Stocks	1-year return in 2004		p-value	Significant
		Market	Portfolio		
1	144	-6.58%	-4.16%	0.28464	No
2	93	-6.58%	-3.91%	0.33668	No
3	26	-6.58%	-4.41%	0.32467	No
4	35	-6.58%	10.16%	0.14074	No
5	16	-6.58%	-5.47%	0.42235	No

*10% significance, **5% significance, ***1% significance.

Table 10. Results of two-year portfolios in the year 2004

Screening Rule	Number of Stocks	2-year return in 2004		p-value	Significant
		Market	Portfolio		
1	139	16.74%	33.54%	0.00229	Yes ***
2	89	16.74%	35.50%	0.00999	Yes ***
3	26	16.74%	23.12%	0.24256	No
4	35	16.74%	39.70%	0.08637	Yes *
5	16	16.74%	39.70%	0.41282	No

*10% significance, **5% significance, ***1% significance.

Table 11. Results of one-year portfolios in the year 2005

Screening Rule	Number of Stocks	1-year return in 2005		p-value	Significant
		Market	Portfolio		
1	182	24.96%	50.28%	0.00000	Yes ***
2	135	24.96%	50.13%	0.00000	Yes ***
3	44	24.96%	44.73%	0.00186	Yes ***
4	56	24.96%	43.73%	0.00189	Yes ***
5	28	24.96%	33.68%	0.08763	Yes ***

*10% significance, **5% significance, ***1% significance.

Table 12. Results of two-year portfolios in the year 2005

Screening Rule	Number of Stocks	2-year return in 2005		p-value	Significant
		Market	Portfolio		
1	176	71.00%	138.00%	0.00000	Yes ***
2	130	71.00%	148.66%	0.00000	Yes ***
3	42	71.00%	106.46%	0.00445	Yes ***
4	55	71.00%	152.45%	0.00210	Yes ***
5	27	71.00%	84.57%	0.16143	No

*10% significance, **5% significance, ***1% significance.

Table 13. Results of one-year portfolios in the year 2006

Screening Rule	Number of Stocks	1-year return in 2006		p-value	Significant
		Market	Portfolio		
1	186	36.84%	59.84%	0.00006	Yes ***
2	131	36.84%	69.35%	0.00007	Yes ***
3	42	36.84%	54.71%	0.03781	Yes **
4	40	36.84%	66.45%	0.03704	Yes **
5	16	36.84%	47.56%	0.26135	No

*10% significance, **5% significance, ***1% significance.

Table 14. Results of two-year portfolios in the year 2006

Screening Rule	Number of Stocks	2-year return in 2006		p-value	Significant
		Market	Portfolio		
1	183	-20.13%	-3.13%	0.00000	Yes ***
2	128	-20.13%	-1.78%	0.00000	Yes ***
3	42	-20.13%	-8.58%	0.01206	Yes **
4	40	-20.13%	12.33%	0.00004	Yes ***
5	16	-20.13%	1.43%	0.00123	Yes ***

*10% significance, **5% significance, ***1% significance.

Table 15. Results of one-year portfolios in the year 2007

Screening Rule	Number of Stocks	1-year return in 2007		p-value	Significant
		Market	Portfolio		
1	181	-41.63%	-31.55%	0.00000	Yes ***
2	92	-41.63%	-28.34%	0.00000	Yes ***
3	35	-41.63%	-31.27%	0.00039	Yes ***
4	39	-41.63%	-24.65%	0.00017	Yes ***
5	18	-41.63%	-30.45%	0.01214	Yes **

*10% significance, **5% significance, ***1% significance.

Table 16. Results of two-year portfolios in the year 2007

Screening Rule	Number of Stocks	2-year return in 2007		p-value	Significant
		Market	Portfolio		
1	172	-13.28%	4.96%	0.00000	Yes ***
2	87	-13.28%	8.39%	0.00001	Yes ***
3	33	-13.28%	0.81%	0.00899	Yes ***
4	38	-13.28%	19.19%	0.00049	Yes ***
5	17	-13.28%	4.44%	0.00831	Yes ***

*10% significance, **5% significance, ***1% significance.

Table 17. Results of one-year portfolios in the year 2008

Screening Rule	Number of Stocks	1-year return in 2008		p-value	Significant
		Market	Portfolio		
1	228	48.57%	72.08%	0.00000	Yes ***
2	176	48.57%	74.49%	0.00001	Yes ***
3	54	48.57%	72.88%	0.00110	Yes ***
4	100	48.57%	73.80%	0.00023	Yes ***
5	35	48.57%	71.29%	0.00088	Yes ***

*10% significance, **5% significance, ***1% significance.

Table 18. Results of two-year portfolios in the year 2008

Screening Rule	Number of Stocks	2-year return in 2008		p-value	Significant
		Market	Portfolio		
1	190	81.18%	114.73%	0.00000	Yes ***
2	141	81.18%	121.26%	0.00000	Yes ***
3	42	81.18%	127.98%	0.00198	Yes ***
4	82	81.18%	127.76%	0.00001	Yes ***
5	28	81.18%	132.97%	0.00410	Yes ***

*10% significance, **5% significance, ***1% significance.

Table 19. Results of one-year portfolios in the year 2009

Screening Rule	Number of Stocks	1-year return in 2009		p-value	Significant
		Market	Portfolio		
1	159	21.95%	36.87%	0.00005	Yes ***
2	107	21.95%	39.12%	0.00001	Yes ***
3	32	21.95%	40.87%	0.00081	Yes ***
4	71	21.95%	44.19%	0.00001	Yes ***
5	30	21.95%	41.59%	0.00107	Yes ***

*10% significance, **5% significance, ***1% significance.