

# Application of the Stock Selection Criteria of Three Value Investors, Benjamin Graham, Peter Lynch, and Joel Greenblatt: A Case of Shanghai Stock Exchange from 2006 to 2011

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**Abstract** - The researcher would like to find out if the value investing methods work in the Shanghai Stock Exchange (SSE) or not, and if they do, then the research compared and identified the method which give the highest return for the SSE.

The secondary data used in this research were the fundamentals of companies listed in the Shanghai Stock Exchange A Share Index from year 2006 to 2011. There were total of seven selection methods in this study. Three stock selection methods were applied from the Benjamin Graham's criteria, two selection methods were adopted from Peter Lynch's criteria, and two selection methods were from Joel Greenblatt's Magic formula. The stocks listed in SSEAI were filtered by these seven screening rules, and then equal-weight portfolios were set up with stocks which can pass the screening rules. The returns of portfolios were compared with market return.

This research found that the portfolios that created by Peter Lynch and Joel Greenblatt's methods produced higher return than market in each year from 2007 to 2010, and the portfolios that created by Benjamin Graham's method produced higher return than market in each year from 2007 to 2011, except eight portfolios had no stock and no return. The researcher also found that the returns of portfolios are not higher than the market returns in year 2006 due to the Chinese government launched the new policy for stock trading.

**Index Terms**– Value Investment, Return, Portfolio, Stock

## I. INTRODUCTION

Benjamin Graham created value investing which is a kind of stock investing approach (Truong, 2010). This method emphasizes buying the stocks with market prices that are lower than their intrinsic value and then selling them when their market prices are higher than intrinsic value. Graham & Zweig (2004) suggested that it is a wise action not overpaying for an investments. For selecting undervalued stocks, it needs to combine these criteria into stock selecting screening rules. Oppenheimer (1984) mentioned that stock selection rules which are the combinations of criteria can produce different returns. It is not necessary that the combination of more criteria can make higher return or the combination of fewer criteria just make

lower returns. The researcher needs to find the best combination that produces that highest return.

Some tests of combination of criteria had been carried out in Malaysia and Thailand. Portfolios are set up by using these stock selecting screening rules which are made by criteria. The returns of the portfolios performed superior compared with the relevant stock market (Change, 2011).

In the short 20 years of China stock market, the investment philosophy of Chinese investors has changed many times. With the bull market in year 2006 to the bear market in year 2008, the investors' attitude becomes pessimistic from optimistic. Is there one investment philosophy which can lead Chinese investors make effective decision on investment? Since 2003, the market has shown obvious signs of value investment, the fund as a representative launched the value investment in stock market. Does the value investing work in Chinese stock market?

Peter Lynch and Joel Greenblatt are representative value investors. Although their theories are developed on the method of Benjamin Graham, these two investors applied criteria in different ways. The researcher will test combination of the three investors' criteria in Shanghai Stock Exchange.

Graham (2004) came up with seven criteria regarding quality and quantity for selecting common stocks. The first three criteria are representative of the financial strength of a company while the next four are representative of what returns can be expected from it. Lynch (1990) suggested there are nine quantitative data which he thinks investors should consider before investing in. The formula of price-to-earnings ratio compared with growth ratio is representative the reasonable of the stock price, the criterion of dividends reflects the return investors can get from company. The other criteria of Lynch are representative of the financial condition of a company. Greenblatt (2004) said the companies

were ranked base on two key factors: return on capital and earning yield. Return on capital can be measured by the first two criteria and earning yield can be measured by the last criterion. Guidolin and Nicodano (2009), Piotroski (2000), Ball, Sadka and Sadka (2009), Basu (1983), Lamont(1998), Rousseau and Renburg (2004) had proved these criteria can measure the company's financial condition and effect the investment return.

**Table 1 The three investors' stock selection criteria**

Benjamin's stock selection criteria	Peter Lynch's stock selection criteria	Joel Greenblatt's stock selection criteria
1.Sufficient size of enterprise 2.An good financial condition 3.Earnings stability 4.Dividend record 5.Earnings growth 6.Moderate price-to-earnings ratio 7.Moderate price-to-book ratio	1.The percentage of total sales 2.The formula of price-to-earnings ratio compared with growth ratio 3.Cash position 4.Ratio of debt to equity 5.Dividends 6.Hidden Assets 7.Cash flow 8.Inventory 9.Pension fund asset	1.Return on assets 2.Return on equity 3.Price-to-equity ratio

**II. METHODOLOGY**

**Research Data**

The researcher will test the stocks selected from Shanghai Stock Exchange A Share Index from year 2006 to 2011. All of the secondary data used in this research are obtained from Bloomberg Terminal and the website of SSE. The codes and name of all stocks in the SSEAI and financial data required in screening rules were got from Bloomberg Professional Terminal. Shanghai Stock Exchange posts the introduction, annual report and news of listed companies on their official website. There also have the whole basic information about each index. The researcher got the SSEAI data from this website.

**Screening Rules and Portfolio Construction**

To select the undervalued stocks from SSE, researcher combines some criteria of the three investors' as selection stock screening rule. There are total of seven selection stock screening rules in this research, three of them are applied from the Benjamin Graham's criteria, two of them from Peter Lynch's criteria, and two rules from Joel Greenblatt's Magic formula.

The rules from Benjamin Greham:

1. The portfolio which is created by criteria with  $PE < 15$ ,  $PB < 1.5$
2. The portfolio which is created by criteria with  $PE < 15$ ,  $PB < 1.5$  and  $DY > 3\%$
3. The portfolio which is created by criteria with  $PE < 15$ ,  $PB < 1.5$  and  $CR > 2$

The rules from Peter Lynch:

1. The portfolio which is created by common stock selection formula
2. The portfolio which is created by common stock selection formula and  $DE < 0.334$

The rules from Joel Greenblatt:

1. The portfolio which is created by using top 30 ranking of PE and ROA
2. The portfolio which is created by using top 30 ranking of PE and ROE

An equal weighted portfolio will be constructed by each screening rule for each year from 2006 to 2011. One-year

return and two-year return of portfolio will be calculated for each year except there is not enough data for calculating.

The formula of total return:

Total return

$$= \text{dividend paid} + \text{capital gains}$$

Where Capital gain

$$= \text{sell price} - \text{purchase price}$$

Therefore the total return in ratio is:

Total return

$$= \frac{(\text{dividend paid} + \text{capital gains})}{\text{beginning price per share}}$$

To compare the return of each year, researcher needs to calculate one-year return and two-year return, the following one-year return formula was used:

1 – year return at year t

$$= \frac{D_{t+1} + P_{t+1} - P_t}{P_t}$$

Where D = Dividend paid

P = Price of stock at year end

t = Current year

the two-year return formula was used:

$$= \frac{D_{t+1} + D_{t+2}}{P_t} + \frac{P_{t+2} - P_t}{P_t}$$

Where D = Dividend paid

P = Price of stock at year end

t = Current year

**III. STATISTICAL TREATMENT OF DATA**

After getting the return of each year, the researcher will use the t-test statistic to test the hypothesis that measure the significance of each return compared to the return of the Shanghai Stock Exchange A Share Index. For this research, significance of the return of portfolio is tested by the one-tailed t-test to get the evidence to reject or not to reject the hypothesis.

In this research, the return of market refers to the return of SSE A share Index. A mean is used to test the hypothesis. Therefore each hypothesis is as follows:

$H_0$  : Return of the portfolio  $\leq$  Return of the market

$H_a$  : Return of the portfolio  $>$  Return of the market

$$t = \frac{\bar{X} - \mu}{\frac{s}{\sqrt{n}}}$$

Where  $\bar{x}$  = mean of portfolio return

$\mu$  = mean return of SSE A share index

$s$  = standard deviation of the sample

$n$  = number of stocks in portfolio

#### IV. RESULTS AND FINDINGS

The purpose of this research is to test if the value investing methods from Benjamin Graham, Peter Lynch, and Joel Greenblatt work in the Shanghai Stock Exchange (SSE) or not, and if they do, then the research will also compare and identify which method can get highest return from the Shanghai Stock Exchange from 2006 to 2011.

Using the first screening rule, researcher gets the portfolios which produced significantly greater one-year returns than the market for three out of six years, and produced significantly greater two-year returns than the market for three out of five years. The portfolio that got higher return but cannot be tested by t-test is in the year 2008; because there is only one stock that can pass the screening rule in this year. No stock can be selected in year 2010, therefore there is no return and cannot compare with market return.

Using the second screening rule, researcher gets the portfolios which produced significantly greater one-year returns than the market for two out of six years, and produced significantly greater two-year returns than the market for three out of five years. No stock can be selected in years 2008 and 2010, therefore there is no return and cannot compare with market return in these two years.

Using the third screening rule, researcher gets the portfolios which produced significantly greater one-year returns than the market for two out of six years, and produced significantly greater two-year returns than the market for three out of five years. The portfolio that got higher return but cannot be tested by t-test is in the years 2008; because there is only one stock can pass the screening rule in this year. No stock can be selected in year 2010, therefore there is no return and cannot compare with market return.

For the fourth screening rule, researcher gets the portfolios which produced significantly greater one-year returns than the market for four out of six years, and produced significantly greater two-year returns than the market for all the five years.

For the fifth screening rule, researcher gets the portfolios which produced significantly greater one-year returns than the market for four out of six years, and produced significantly greater two-year returns than the market for all the five years.

For the sixth screening rule, researcher gets the portfolios which produced significantly greater one-year returns than the market for four out of six years, and produced significantly greater two-year returns than the market for all the five years.

For the seventh screening rule, researcher gets the portfolios which produced significantly greater one-year returns than the

market for five out of six years, and produced significantly greater two-year returns than the market for all the five years.

The researcher found that the portfolio comprising stocks selected based on Lynch's formula and DE ratio of 33.4% or lower produced the highest returns for five times out of eleven comparison. Benjamin Graham and Joel Greenblatt each get three times.

In this research, there are 52 out of 77 hypotheses that obtained significantly higher returns than the return of the Shanghai Stock Exchange A Share Index. Out of the 25 hypotheses that did not generate significantly higher returns than the market return, 17 hypotheses tested Benjamin Graham's criteria, 4 hypotheses tested Peter Lynch's criteria, and last 4 hypotheses tested Joel Greenblatt's criteria. Out of the 17 hypotheses that did not generate significantly higher return for Graham, 8 hypotheses still produced higher return than market, and 6 hypotheses did not include any stock and no return.

#### V. CONCLUSION

The returns of most hypotheses used in this research are higher than the return of stock market. Therefore, the stock selection criteria can be used in Shanghai Stock Exchange to choose stock to invest in. The stocks selection method which is based on Lynch's formula and debt-to-equity ratio had highest frequency to get highest return in SSE from 2006 to 2011. The portfolios which were created by this stock screening rule produced significantly higher return than market with most often. Consequently, it is the screening rule which can give the highest return in this research. Investor can apply this rule to select stock in SSE.

In consideration of the returns of all portfolio were not higher than market in year 2006, the researcher suggests that investor should pay more attention on policies issued by the Chinese government, because it can deeply affect stock price and return. The Chinese government made a decision that investors can trade the shares which could not be traded in stock market before year 2006. This decision makes the volume of shares in market increase and pushes the stock price up with much bubble.

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APPENDIX

**Table 1: Summary of 1-year return in the year 2006**

Screening rule	1-year return in year 2006		# stocks	p-value	Significant
	Market	Portfolio			
Benjamin's rule 1	130.57%	66.14%	66	1	No
Benjamin's rule 2	130.57%	73.38%	37	0.999	No
Benjamin's rule 3	130.57%	58.11%	6	0.983	No
Peter's rule 1	130.57%	97.61%	132	0.999	No
Peter's rule 2	130.57%	113.72%	37	0.807	No
Joel's rule 1	130.57%	82.09%	30	0.999	No
Joel's rule 2	130.57%	81.32%	30	0.999	No

\*10% significant, \*\*5% significant, \*\*\*1% significant

**Table 2: Summary of 2-year return in the year 2006**

Screening rule	2-year return in year 2006		# stocks	p-value	Significant
	Market	Portfolio			
Benjamin's rule 1	352.24%	442.90%	66	0.002	Yes***
Benjamin's rule 2	352.24%	458.49%	37	0.002	Yes***
Benjamin's rule 3	352.24%	378.99%	6	0.371	No
Peter's rule 1	352.24%	470.92%	132	0.000	Yes***
Peter's rule 2	352.24%	547.38%	37	0.027	Yes**
Joel's rule 1	352.24%	500.60%	30	0.001	Yes***
Joel's rule 2	352.24%	498.12%	30	0.000	Yes***

\*10% significant, \*\*5% significant, \*\*\*1% significant

**Table 3: Summary of 1-year return in the year 2007**

Screening rule	1-year return in year 2007		# stocks	p-value	Significant
	Market	Portfolio			
Benjamin's rule 1	96.14%	243.44%	31	0.000	Yes***
Benjamin's rule 2	96.14%	247.60%	12	0.001	Yes***
Benjamin's rule 3	96.14%	305.61%	4	0.064	Yes*
Peter's rule 1	96.14%	210.69%	175	0.000	Yes***
Peter's rule 2	96.14%	191.94%	55	0.000	Yes***
Joel's rule 1	96.14%	337.39%	30	0.000	Yes***
Joel's rule 2	96.14%	315.81%	30	0.000	Yes***

\*10% significant, \*\*5% significant, \*\*\*1% significant

**Table 4. Summary of 2-year return in the year 2007**

Screening rule	2-year return in year 2007		# stocks	p-value	Significant
	Market	Portfolio			
Benjamin's rule 1	-32.09%	20.53%	31	0.000	Yes***
Benjamin's rule 2	-32.09%	5.41%	12	0.000	Yes***
Benjamin's rule 3	-32.09%	29.44%	4	0.002	Yes***
Peter's rule 1	-32.09%	17.76%	175	0.000	Yes***
Peter's rule 2	-32.09%	19.01%	55	0.000	Yes***
Joel's rule 1	-32.09%	44.38%	30	0.001	Yes***
Joel's rule 2	-32.09%	23.03%	30	0.000	Yes***

\*10% significant, \*\*5% significant, \*\*\*1% significant

**Table 5. Summary of 1-year return in the year 2008**

Screening rule	1-year return in year 2008		# stocks	p-value	Significant
	Market	Portfolio			
Benjamin's rule 1	-65.38%	10.62%	1	NA	NA
Benjamin's rule 2	-65.38%	NA	0	NA	NA
Benjamin's rule 3	-65.38%	10.62%	1	NA	NA
Peter's rule 1	-65.38%	-58.07%	176	0.000	Yes***
Peter's rule 2	-65.38%	-54.93%	53	0.000	Yes***
Joel's rule 1	-65.38%	-59.74%	30	0.068	Yes*
Joel's rule 2	-65.38%	-64.68%	30	0.422	No

\*10% significant, \*\*5% significant, \*\*\*1% significant

**Table 6. Summary of 2-year return in the year 2008**

Screening rule	2-year return in year 2008		# stocks	p-value	Significant
	Market	Portfolio			
Benjamin's rule 1	-37.74%	150.01%	1	NA	NA
Benjamin's rule 2	-37.74%	NA	0	NA	NA
Benjamin's rule 3	-37.74%	150.01%	1	NA	NA
Peter's rule 1	-37.74%	-1.96%	176	0.000	Yes***
Peter's rule 2	-37.74%	5.79%	53	0.000	Yes***
Joel's rule 1	-37.74%	3.79%	30	0.000	Yes***
Joel's rule 2	-37.74%	-13.06%	30	0.002	Yes***

\*10% significant, \*\*5% significant, \*\*\*1% significant

**Table 7. Summary of 1-year return in the year 2009**

Screening rule	1-year return in year 2009		# stocks	p-value	Significant
	Market	Portfolio			
Benjamin's rule 1	79.80%	181.53%	50	0.000	Yes***
Benjamin's rule 2	79.80%	147.71%	15	0.000	Yes***
Benjamin's rule 3	79.80%	162.73%	11	0.003	Yes***
Peter's rule 1	79.80%	150.28%	152	0.000	Yes***
Peter's rule 2	79.80%	176.79%	50	0.000	Yes***
Joel's rule 1	79.80%	184.87%	30	0.000	Yes***
Joel's rule 2	79.80%	182.33%	30	0.000	Yes***

\*10% significant, \*\*5% significant, \*\*\*1% significant

**Table 8. Summary of 2-year return in the year 2009**

Screening rule	2-year return in year 2009		# stocks	p-value	Significant
	Market	Portfolio			
Benjamin's rule 1	53.80%	147.19%	50	0.000	Yes***
Benjamin's rule 2	53.80%	115.28%	15	0.015	Yes**
Benjamin's rule 3	53.80%	146.20%	11	0.006	Yes***
Peter's rule 1	53.80%	167.18%	152	0.000	Yes***
Peter's rule 2	53.80%	229.81%	50	0.000	Yes***
Joel's rule 1	53.80%	195.57%	30	0.000	Yes***
Joel's rule 2	53.80%	179.23%	30	0.000	Yes***

\*10% significant, \*\*5% significant, \*\*\*1% significant

**Table 9. Summary of 1-year return in the year 2010**

Screening rule	1-year return in year 2010		# stocks	p-value	Significant
	Market	Portfolio			
Benjamin's rule 1	-14.46%	NA	0	NA	NA
Benjamin's rule 2	-14.46%	NA	0	NA	NA
Benjamin's rule 3	-14.46%	NA	0	NA	NA
Peter's rule 1	-14.46%	12.54%	150	0.000	Yes***
Peter's rule 2	-14.46%	15.11%	52	0.000	Yes***
Joel's rule 1	-14.46%	1.17%	30	0.004	Yes***
Joel's rule 2	-14.46%	7.69%	30	0.001	Yes***

\*10% significant, \*\*5% significant, \*\*\*1% significant

**Table 10. Summary of 2-year return in the year 2010**

Screening rule	2-year return in year 2010		# stocks	p-value	Significant
	Market	Portfolio			
Benjamin's rule 1	-32.97%	NA	0	NA	NA
Benjamin's rule 2	-32.97%	NA	0	NA	NA
Benjamin's rule 3	-32.97%	NA	0	NA	NA
Peter's rule 1	-32.97%	-20.87%	150	0.000	Yes***
Peter's rule 2	-32.97%	-17.77%	52	0.000	Yes***
Joel's rule 1	-32.97%	-25.27%	30	0.082	Yes*
Joel's rule 2	-32.97%	-22.58%	30	0.034	Yes**

\*10% significant, \*\*5% significant, \*\*\*1% significant

**Table 11. Summary of 1-year return in the year 2011**

Screening rule	1-year return in year 2011		# stocks	p-value	Significant
	Market	Portfolio			
Benjamin's rule 1	-21.64%	4.57%	15	0.064	Yes*
Benjamin's rule 2	-21.64%	-19.71%	2	0.129	No
Benjamin's rule 3	-21.64%	-13.98%	2	0.316	No
Peter's rule 1	-21.64%	-7.11%	213	0.179	No
Peter's rule 2	-21.64%	-24.77%	56	0.844	No
Joel's rule 1	-21.64%	-23.61%	30	0.641	No
Joel's rule 2	-21.64%	-6.87%	30	0.061	Yes*

\*10% significant, \*\*5% significant, \*\*\*1% significant