

Risk-Reward Agility of the Benjamin Graham and Joel Greenblatt's Investing Philosophy in the Indian Stock Market

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ABSTRACT

There are various value stocks picking methods and various studies on value investing in past. Still there is disbelief related to effectiveness of value investing. Various studies on value investing inferred that value investing resulted higher returns than market average. The Graham stock selection criteria is widely appreciated and acknowledged across the globe. This methodological framework for stock investing is well lived and demonstrated by the equally agile and legend investor Warren Buffet for sustained wealth creation. But the investment literature supports even more robustness of the Greenblatt's magic formula for a similar purpose.

The study tested the two stock selection criteria, viz. Benjamin Graham's investing strategy and Joel Greenblatt's Magic Formula from 2010 to 2018 and compared the portfolios return with the market benchmark NSE 50 and NSE 500. In the study, in Graham portfolio returns out of 8 year in 5 years are better than market benchmark (NSE 50) average returns and out of 8 years in 5 years have beaten the market benchmark (NSE 500) average returns but Greenblatt portfolio returns in 6 years generated superior than the market benchmark (NSE 500 and NSE 50) average returns as well as Graham portfolio average returns. Unsystematic risk (standard deviation) and systematic risk (beta) both in Graham are less in comparison to market benchmark as well as Greenblatt selection criterion. In terms of risk-reward measure viz., Sharpe ratio, Treynor ratio, Sortino ratio, and Jensen's alpha of Graham criterion demonstrated superior returns than the market benchmark (NSE 50 and NSE 500) and Greenblatt demonstrate that the portfolio performed better than market benchmark (NSE 50 and NSE 500) as well as Graham. On the whole, the study results documented a superiority of the Greenblatt measure over the Benjamin Graham criterion both in terms of return generation as well as risk – reward trade off in Indian stock market during the study period, January 2010 through December 2018.

1. Introduction

Value investing is a stock investing perspective pioneer by Benjamin Graham (often cited as the father of value investing), epitomized the ideas of investing from his trading experience in the stock market. Value investing is a long term perspective approach based on believes that in long run investment results in superior returns. There are various value stocks picking methods and various studies on value investing in past. Still there is disbelief related to effectiveness of value investing. Various studies on value investing inferred that value investing resulted higher returns than market average.

Benjamin Graham's investing philosophy weighted to investing in that stocks which intrinsic value are exceeds than their market prices. The study employed two investing strategy; Benjamin Graham's criteria (Filter 1) and Joel Greenblatt's Magic Formula investing strategy (Filter 2) in Indian stock market for period January 2010 to December 2018.

Benjamin Graham's criteria (Filter 1) include P/E ratio, P/B ratio, and Dividend Yield (these three ratios indicate that any stocks have high intrinsic value than their price) used for construct the portfolio. And Joel Greenblatt's Magic Formula investing strategy (Filter 2) consist Return on Capital and Earnings Yield used for construct portfolio. The researcher

tests the both strategy and makes comparison which strategy beat the Indian market in long run.

Joel Greenblatt explains his investing strategy namely Magic Formula in his written book "The Little Book That Beats the Market". Return on capital is a measure of management efficiency of using capital and create value for shareholders. Higher the return on capital indicates that companies have better chance to invest their profit in high yielding project. Higher Earnings Yield indicate that higher earning generate by stocks in proportion to share price increased. Portfolio constructed on the base of Magic Formula excludes 'Financials' and 'Utilities' companies out of sample.

The study measure the risk-reward of the portfolio using Standard deviation, Beta, Sharpe ratio, Treynor ratio, Sortino ratio, and Jesnsen's Alpha. The study resulted that both the strategies perform better than market average. Joel Greenblatt's strategy provided superior results in comparison to Benjamin Graham investing philosophy in Indian stock market during the period 2010-2018.

2. Review of Literature

Value investing that is a stock investing perspective pioneer by Benjamin Graham who is known as father of value

investing. Benjamin Graham epitomized the ideas of investing from his trading experience in the stock market. Joel Greenblatt's Magic Formula strategy is also a value investing strategy based on mainly two criteria that is; Return on Capital and Earning Yield. Value investing is based on fundamental analysis of companies like P/E ratio, P/B ratio, Dividend Yield, Return on Capital, and Earnings Yield all are fundamental indicators. Consistently higher returns on investment can be attained by following value investing approach of selected stocks of low price earnings ratio is suggested by Truong (2009).

Benjamin Graham's investing philosophy weighted to investing in that stocks which intrinsic value are exceeds than their market prices. Graham set criteria for picking undervalued stocks and asserted that the stocks which go through the criteria were yielding average returns above than the market returns (Graham 1934). Oppenheimer (1984) tested the Graham's criteria from year 1974-1981 to construct the portfolios and resulted that returns were higher than the market.

Basu (1977) implemented the test using Sharpe, Treynor, and Jensen's alpha measures, result imply that the low P/E ratio portfolio averagely outer perform than the random portfolios which have equivalent risk. And similar results were found by Chan, Hamao, & Lakonishok (1991) and Athanassakos (2011).

Sareewiwathana and Janin (2017) tested the Graham and Greenblatt's investing strategy by using Sharpe ratio and Standard deviation and resulted that both the strategies outer perform the market. Ye (2013) tested the Benjamin Graham and Joel Greenblatt's Magic Formula strategy in Shanghai Stock Exchange and resulted that investing strategy perform better than market average returns except in year 2006 due to new policy enforcement by Chinese government.

The return on capital and earning yield is used by Greenblatt (2010) to rank company on the basis this criteria and same is asserted by Basu (1983), Ball, Sadka & Sadka (2009), Rousseau and Renburg (2004) and Guidolin and Nicodano (2009) that the Greenblatt's stock picking criteria is positively affect the returns of investment mostly.

Blackburn and Calkici (2017) tested the modified Magic Formula in which gross profits is used as measures of profitability in Japan, North America, Asia and Europe for period 1991-2016 and resulted that portfolio outer perform than market. Hoor (2017) tested the magic formula for period June 1996- May 2017 and resulted that portfolio is outer perform in comparison to Russell 3000 Index.

3. Data and Methodology:

The Graham stock selection criteria is widely appreciated and acknowledged across the globe. This methodological framework for stock investing is well lived and demonstrated by the equally agile and legend investor Warren Buffet for sustained wealth creation. But the investment literature supports even more robustness of the Greenblat's magic

formula for a similar purpose. Keeping this into consideration, an attempt has been made in this paper to document evidence in this regard from the Indian Stock market and compare the outcome of the two criteria.

The study identified the stocks from NSE 500 a share index of National Stock Exchange from year January 2010 to December 2018. All of the data used in this study collected from the PROWESS data base of CMIE. Select two indices of NSE for comparison NSE 50 and NSE 500. Stocks return taken on weekly basis from Yahoo Finance.

Table 1: Stock Selection Criteria of Value Investors

Benjamin Graham's Stock Selection Criteria	Joel Greenblatt's Stock Selection Criteria
P/E ratio less than 10	Return on Capital
P/B ratio less than 1	Earning Yield
Dividend Yield above 3%	

According to Benjamin Graham investment philosophy, stocks which have intrinsic value far exceeds their prices are best for investment. Following are the indicators which show that intrinsic value of stock is exceeds their prices:

- Price to Earnings (P/E) ratio
- Price to Book value (P/B) ratio
- Dividend Yield ratio

FILTER 1-

Picking stocks using Benjamin Graham's three stock selection criteria: P/E, P/B, and Dividend Yield.

Step 1:

In the beginning of each year, from 2010 to 2018, construct a portfolio with stocks that fulfils the above three criteria. Invest in each stock.

Step 2:

Calculate the return in the year-end and compare it with market returns.

Step 3:

Repeat the same process in next year and make a new portfolio and invest in each stock and compare returns in the year end. Same process follows in other years also.

FILTER 2-

Picking stocks using Joel Greenblatt's Magic Formula.

Step 1:

In the beginning of each year, from 2010 to 2018, rank the stocks on the basis of return on capital (ROC). Assign rank 1 to the highest return on capital and so on.

Step 2:

Similarly, rank the stocks on the basis of Earnings Yield (E/Y). Assign rank 1 to the highest earnings yield (E/Y) and so on.

Step 3:

Combine the both ranks and select the top 30 lowest combine rank score stocks to construct the portfolio. And invest in each stocks of portfolio.

Step 4:

Calculate the return of portfolio in the year-end and compare with market return.

Step 5:

Repeat the same process in next year and construct a new portfolio of 30 stocks. Invest in each and compare return in the end of year with market return. Same process follows for other years also.

Return Measurement:

$$\text{Return} = \text{LN} (\text{Current year return}/\text{Previous year return})$$

Risk Measurement:

$$\text{Standard Deviation} = \sqrt{\sum_{i=1}^N (r - \text{ERR})^2 \times P}$$

$$\text{Beta} = \frac{\text{Covariance (Portfolio Returns: Market Returns)}}{\text{Variance (Market Returns)}}$$

Risk Reward Ratio:

$$\text{Sharpe Ratio} = \frac{\text{Mean of Excess Return}}{\text{Standard Deviation of Excess Return}}$$

$$\text{Treynor Ratio} = \frac{\text{Mean of Excess Return}}{\text{Beta}}$$

$$\text{Sortino Ratio} = \frac{\text{Mean of Excess Return}}{\text{Downside Deviation}}$$

$$\text{Jensen's Alpha} = \text{Portfolio Return} - [\text{Risk free rate} + \text{Portfolio Beta} (\text{Market Return} - \text{Risk free rate})]$$

$$\text{Excess Return} = \text{Portfolio Return} - \text{Risk free rate of return}$$

Risk free rate of return is taken of 91-days treasury bills.
Source: https://www.rbi.org.in/Scripts/BS_NSDDPDisplay.aspx

Table 2: Portfolio's returns compared to the market return

YEAR	NO. OF STOCKS IN FILTER 1	NO. OF STOCKS IN FILTER 2	NSE 50 RETURN	NSE 500 RETURN	FILTER 1 RETURN	FILTER 2 RETURN
2011	10	30	-0.47923	-0.54509	-0.47293	-0.11234
2012	38	30	0.41694	0.480458	0.291771	0.511647
2013	21	30	0.098769	0.032913	0.215504	0.610483
2014	39	30	0.568706	0.654258	0.299494	1.60342
2015	8	30	-0.03733	0.031204	0.460459	0.426768
2016	17	30	0.150832	0.064167	0.459243	0.371083
2017	11	30	0.480066	0.573717	0.547747	0.58935
2018	5	30	0.054532	-0.0828	0.545201	0.020137
AVERAGE			0.156661	0.151103	0.293311	0.502569

Average return of Filter 1 in comparison to NSE 50 Index return is **87.23% above** and in comparison to NSE 500 Index return it is **94.11% above**. In 5 years out of 8 years Filter 1 return is higher than NSE 50 Index return and in 4 years out of 8 years Filter 1 return is higher than NSE 500 Index return.

Average return of Filter 2 in comparison to NSE 50 Index return is **220.8% above** and in comparison to NSE 500 Index return it is **232.6% above**. In 6 years out of 8 years Filter 2 return is higher than NSE 50 Index return and in 6 years out of 8 years Filter 2 return is higher than NSE 500 Index return.

Table 3: Risk Measure of Filter 1 Portfolio.

YEAR	FILTER 1				
	σ OF PORTFOLIO RETURN	σ OF NSE 50 INDEX RETURN	σ OF NSE 500 INDEX RETURN	Portfolio BETA(NSE 50)	Portfolio BETA (NSE 500)
2011	2.702812916	3.051940686	2.853918	0.583953	0.67091
2012	1.637910128	1.883846724	1.888039	0.558033	0.60393
2013	2.603480523	2.417016372	2.341935	0.737027	0.820496
2014	2.104443383	1.71121835	1.808329	0.421309	0.508416
2015	2.536171484	2.375514847	2.303055	0.754781	0.722379
2016	3.119858587	2.33241796	2.296141	0.79106	0.143064
2017	2.277777912	1.293809152	1.337309	0.785984	0.982954
2018	3.294022087	1.840116884	1.935175	-0.05423	0.010396
AVERAGE	2.534559627	2.113235122	2.095487	0.57224	0.557818

The returns variability (risk) was noticed higher, 2.534559627 compared to the market benchmark (NSE 50 (2.113235122), and NSE 500 (2.095487) in commensurate with the returns generated in Table (3) in terms of stock selection criteria of Filter 1.

The systematic risk (Beta) was noticed higher, 0.57224 and 0.557818 compared to the market benchmark Beta (NSE 50 (1.0) and NSE 500 (1.0)) in commensurate with the returns generated in Table (3) in terms of stock selection criteria of Filter1. Thus, the Table (3) concluded that the Filter 1 have high variability (unsystematic risk) and lower Beta (systematic risk).

Table 4: Risk measure of Filter 2 Portfolio

YEAR	FILTER 2			BETA 50	BETA 500
	σ OF PORTFOLIO RETURN	σ OF NSE 50 INDEX RETURN	σ OF NSE 500 INDEX RETURN		
2011	3.441435	3.051941	2.853918	0.771934	0.889024
2012	1.830985	1.883847	1.888039	0.611597	0.685572
2013	1.745093	2.417016	2.341935	0.382263	0.428228
2014	2.9002	1.711218	1.808329	0.355234	0.422805
2015	2.739444	2.375515	2.303055	0.922992	0.915342
2016	3.83287	2.332418	2.296141	0.847439	0.086348
2017	2.465055	1.293809	1.337309	0.869721	0.981409
2018	2.427587	1.840117	1.935175	0.892156	0.912868
AVERAGE	2.672834	2.113235	2.095487	0.706667	0.665199

The returns variability (risk) was noticed higher, 2.672834 compared to the market benchmark (NSE 50 (2.113235122), and NSE 500 (2.095487) in commensurate with the returns generated in Table (4) in terms of stock selection criteria of Filter 2.

The systematic risk (Beta) was noticed higher, 0.706667 and 0.665199 compared to the market benchmark Beta (NSE 50 (1.0) and NSE 500 (1.0)) in commensurate with the returns generated in Table (4) in terms of stock selection criteria of Filter 2. Thus, the Table (4) concluded that the Filter 2 have high variability (unsystematic risk) and lower Beta (systematic risk).

Table 5: Risk-Return measure ratios of Filter 1

YEAR	Filter 1					
	Sharpe Ratio	Treynor Ratio (NSE 50)	Treynor Ratio (NSE 500)	Sortino ratio	Jensen's alpha (NSE 50)	Jensen's alpha (NSE 500)
2011						
PORTFOLIO	-0.22975	-1.06424	-0.9263	-0.34451	0.591894	0.644629
NSE 50	-0.20564	1.0	1.0	-0.37453	0.0	0.0
NSE 500	-0.24295	1.0	1.0	-0.4131	0.0	0.0
2012						
PORTFOLIO	0.083279	0.244537	0.225953	0.157447	0.251704	0.162343
NSE 50	0.138858	1.0	1.0	0.29666	0.0	0.0
NSE 500	0.172198	1.0	1.0	0.289722	0.0	0.0
2013						
PORTFOLIO	0.021348	0.075324	0.067662	0.035664	0.022714	-0.06205
NSE 50	-0.02533	1.0	1.0	-0.04624	0.0	0.0
NSE 500	-0.05428	1.0	1.0	-0.04741	0.0	0.0
2014						
PORTFOLIO	0.066383	0.331531	0.27473	0.134225	0.028811	-0.08257
NSE 50	0.239086	1.0	1.0	0.471186	0.0	0.0
NSE 500	0.273571	1.0	1.0	0.55203	0.0	0.0
2015						
PORTFOLIO	0.125438	0.421684	0.440599	0.196315	-0.05775	-0.62868
NSE 50	-0.07559	1.0	1.0	-0.11283	0.0	0.0
NSE 500	-0.0482	1.0	1.0	-0.11709	0.0	0.0
2016						
PORTFOLIO	0.107105	0.422467	2.335991	0.187703	-0.33735	0.008937
NSE 50	-0.00392	1.0	1.0	-0.00669	0.0	0.0
NSE 500	-0.04174	1.0	1.0	-0.00657	0.0	0.0

2017						
PORTFOLIO	0.190115	0.55102	0.440603	0.360489	0.242048	-0.06784
NSE 50	0.282479	1.0	1.0	0.507956	0.0	0.0
NSE 500	0.343284	1.0	1.0	0.628515	0.0	0.0
2018						
PORTFOLIO	0.128392	-7.79856	40.67978	0.226389	0.422202	0.417503
NSE 50	-0.03681	1.0	1.0	-0.05714	0.0	0.0
NSE 500	-0.10593	1.0	1.0	-0.15935	0.0	0.0
AVERAGE						
PORTFOLIO	0.061539	-0.85203	5.442377	0.119215	0.145535	0.049034
NSE 50	0.039141	1.0	1.0	0.084796	0.0	0.0
NSE 500	0.036993	1.0	1.0	0.090843	0.0	0.0

The average Sharpe ratio was noticed higher, (0.061539) compared to the average Sharpe ratio of the market benchmark NSE 50 (0.039141) and NSE 500 (0.036993) in commensurate with returns generated in Table (5) in terms of stock selection criteria of Filter 1. The Table (5) concluded that out of 8 years in 5 years Sharpe ratio of the portfolio is higher than average Sharpe ratio of portfolios. In short, higher sharpe ratio specified that portfolio was performed better than other risk-adjusted portfolios.

The average Treynor ratio was noticed lower, (-0.85203) compared to the average treynor ratio of the market benchmark NSE 50 (1.0) and higher (5.442377) than the average treynor ratio of market benchmark NSE 500 (1.0) in commensurate with the returns generated in Table (5) in terms of stock selection criteria of Filter 1. The Table (5) concluded that portfolio performed better than NSE 500 but not to NSE 50 index. This major difference is because of the 2018 year, portfolio return is highly deviated from average and and Beta (NSE 50) is negative that is the major cause of negative and lower average treynor ratio (NSE 50) and average treynor ratio

(NSE 500) is highly positive because of lowest beta (NSE 500) out of 8 years.

The average Sortino ratio was noticed higher, (0.119215) compared to the average Sortino ratio of the market benchmark NSE 50 (0.084796) and NSE 500 (0.090843) in commensurate with returns generated in Table (5) in terms of stock selection criteria of Filter 1. The Table (5) concluded that out of 8 years in 6 years Sortino ratio of the portfolio is higher than the average Sortino ratio of portfolios.

The average of Jensen's alpha of the portfolios (0.145535) and (0.049034) in respect to NSE 50 and NSE 500 were higher and positive than market benchmark NSE 50 and NSE 500 in commensurate with the returns generated in Table (5) in terms of stock selection criteria of Filter 1. The Table (5) concluded that out of 8 years in 4 years Jensen's Alpha of the portfolio (NSE 50) is higher than the average Jensen's Alpha of the portfolios (NSE 50) and out of 8 years in 3 years Jensen's Alpha of the portfolio (NSE 500) is higher than the average Jensen's Alpha of the portfolios (NSE 500).

Table 6: Risk-Return measure ratios of Filter 2

YEAR	Filter 2					
	Sharpe Ratio	Treynor Ratio (NSE 50)	Treynor ratio of (NSE 500)	Sortino ratio	Jensen's alpha (NSE 50)	Jensen's alpha (NSE 500)
2011						
PORTFOLIO	-0.0758	-0.33795	-0.29344	-0.12787	1.34308	1.41683
NSE 50	-0.20564			-0.37453		
NSE 500	-0.24295			-0.4131		
2012						
PORTFOLIO	0.194726	0.58263	0.519763	0.395088	0.482642	0.385718
NSE 50	0.138858			0.29666		
NSE 500	0.172198			0.289722		
2013						
PORTFOLIO	0.258608	1.178496	1.051999	0.613724	0.433482	0.389136
NSE 50	-0.02533			-0.04624		
NSE 500	-0.05428			-0.04741		
2014						
PORTFOLIO	0.497879	4.063815	3.414351	1.146964	1.350125	1.25878
NSE 50	0.239086			0.471186		

NSE 500	0.273571			0.55203		
2015						
PORTFOLIO	0.103896	0.308332	0.310909	0.145787	-0.17524	-0.91532
NSE 50	-0.07559			-0.11283		
NSE 500	-0.0482			-0.11709		
2016						
PORTFOLIO	0.06418	0.29033	2.849351	0.113254	-0.47337	0.049722
NSE 50	-0.00392			-0.00669		
NSE 500	-0.04174			-0.00657		
2017						
PORTFOLIO	0.192534	0.545803	0.483688	0.417891	0.263298	-0.02545
NSE 50	0.282479			0.507956		
NSE 500	0.343284			0.628515		
2018						
PORTFOLIO	-0.04207	-0.11452	-0.11192	-0.07448	-0.0417	0.085066
NSE 50	-0.03681			-0.05714	0.085066	
NSE 500	-0.10593			-0.15935		
AVERAGE						
PORTFOLIO	0.149244	0.814617	1.028088	0.328795	0.39779	0.33056
NSE 50	0.039141	1.0	1.0	0.084796	0.0	0.0
NSE 500	0.036993	1.0	1.0	0.090843	0.0	0.0

The average Sharpe ratio was noticed higher, (0.149244) compared to the average sharpe ratio of the market benchmark NSE 50 (0.039141) and NSE 500 (0.036993) in commensurate with returns generated in Table (6) in terms of stock selection criteria of Filter 2. The Table (6) concluded that out of 8 years in 4 years sharpe ratio of the portfolio is higher than average Sharpe ratio of portfolios. In short, higher Sharpe ratio specified that portfolio was performed better than other risk-adjusted portfolios.

The average Treynor ratio was noticed lower, (0.814617) compared to the average treynor ratio of the market benchmark NSE 50 (1.0) and higher (1.028088) than the average treynor ratio of market benchmark NSE (1.0) in commensurate with the returns generated in Table (6) in terms of stock selection criteria of Filter 2. The Table (6) concluded that lower treynor ratio is because of high systematic risk (Beta) because returns of the portfolio constructed according to Filter 2 is higher than the market benchmark in almost all years. Major cause of the above result is that risk and returns go hand-in- hand.

The average Sortino ratio was noticed higher, (0.328795) compared to the average Sortino ratio of the market benchmark NSE 50 (0.084796) and NSE 500 (0.090843) in commensurate with returns generated in Table (6) in terms of stock selection criteria of Filter 2. The Table (6) concluded that out of 8 years in 4 years Sortino ratio of the portfolio is higher than the average Sortino ratio of portfolios.

The average of Jensen's alpha of the portfolios (0.39779) and (0.33056) in respect to NSE 50 and NSE 500 were higher and positive than market benchmark NSE 50 and NSE 500 in

commensurate with the returns generated in Table (6) in terms of stock selection criteria of Filter 2. The Table (6) concluded that out of 8 years in 4 years Jensen's Alpha of the portfolio (NSE 50) is higher than the average Jensen's Alpha of the portfolios (NSE 50) and out of 8 years in 4 years Jensen's Alpha of the portfolio (NSE 500) is higher than the average Jensen's Alpha of the portfolios (NSE 500).

4. Findings and Conclusions:

Value investing is a long term perspective approach based on believes that in long run investment results in superior returns. There are various value stocks picking methods and various studies on value investing in past. Still there is disbelieve related to effectiveness of value investing. Various studies on value investing inferred that value investing resulted higher returns than market average.

The study employed two investing strategy; Benjamin Graham's investing strategy (Filter 1) and Joel Greenblatt's Magic Formula (Filter 2). In the research, in Filter 1 portfolio returns out of 8 year in 5 years are better than market benchmark (NSE 50) average returns and out of 8 years in 5 years portfolio returns are better than market benchmark (NSE 500) average returns but Filter 2 portfolio returns out of 8 years in 6 years much better than market benchmark (NSE 500 and NSE 50) average returns as well as Filter 1 portfolio average returns. Unsystematic risk (standard deviation) and systematic risk (beta) both in Filter 1 are less in comparison to market benchmark as well as Filter 2 but it is also true that risk and return have positive relation. Risk- Reward measure ratio; Sharpe ratio, Treynor ratio, Sortino ratio, and Jensen's alpha of Filter 1 demonstrate that portfolio performed better than market benchmark (NSE 50 and NSE 500) and Filter 2 demonstrate

that the portfolio performed better than market benchmark (NSE 50 and NSE 500) as well as Filter 1.

The study concluded on the basis of above results that investor can invest in Indian stock market according to Joel

Greenblatt's investing strategy because out of 8 years in 6 years Magic Formula perform much better than market average during the period 2010-2018.

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