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ARTICLE

Time Varying Behavior of the Value Anomaly: Evidence from Indian Stock Market

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Abstract

In the literature, it is noted that a portfolio of value stocks outperforms a portfolio of growth stocks and this phenomenon is called value anomaly. This study explores the behavior of value anomaly in the Indian stock markets over a period from December 2008 to December 2019. This study has taken a dataset collected over a longer time span as compared to all previous studies, it studies the effect of holding period (one to five years) and portfolio formation time (quarter-end). We find time varying behavior of the value anomaly which has been previously unexplored. Earlier researchers have found systematic risk and size to be significant factors that contribute to value anomaly. Controlling for systematic risk and size, we find them in our study size to be a significant factor in explaining the return differential between value and growth portfolios and thus, understanding the behavior of value analysis in Indian stock markets.

Keywords: Value Anomaly; Growth stock; CAPM excess returns; Size adjusted returns.

1 Introduction

There are two important foundational elements to the Theory of Finance, one - the Efficient Market Hypothesis (EMH) and another - the Capital Asset Pricing Model (CAPM). There are many evidences in the literature supporting (Friedman, 1953; Fama et al., 1969) and against (De Bondt, 1985; Poterba and Summers, 1988; Chopra et al., 1992) the applications EMH and CAPM in realistic settings of financial markets. However, there is a growing agreement that not all aspects of observed returns and investor behaviors can be explained by them. The literature provides considerable evidence of excess returns which cannot be explained by EMH and CAPM (Ball, 1978; Basu, 1977; Banz, 1981). This unexplained part of the excess returns has been attributed to various anomalies. These anomalies are found to be persistent across time and space. These anomalies come forth in form of profit/arbitrage opportunities which ideally should not be possible in efficient markets.

Various researchers have observed across markets and over different time spans that portfolio of stocks with low price-to-book(P/B) ratio earn higher returns in comparison to portfolios of stocks with high P/B ratios (Fama and French, 1992; Lakonishok et al., 1994). This observed phenomenon is known as the value anomaly that results in value premium. This study focusses on the value anomaly. Using the data for prices, risk and fundamentals from the last decade, we study the behavior of value anomaly across different holding periods and formation times. We also discuss the performance of quarter end portfolios. This study attempts to study the reason for the value premium by controlling the return differentials for systematic risk and size of the stocks in the portfolios.

Further, it is observed in the literature that markets tend to favor continuation of patterns or momentum for a shorter period of time (up to 12 months) and show abnormal profits for contrarian strategies in long term of 36 months (Dhankar

and Maheshwari, 2014). Also, as value anomaly is often studied alongside contrarian strategies (Lakonishok et al., 1994), we have studied portfolios pertaining to five years so that the nature of the value anomaly with respect to holding time period can be studied as well.

We have also explored the impact of the timing of construction and holding period of these portfolios on value anomaly. One part of the literature follows the norm of calculating returns in June end, as followed by (Fama and French, 1992). Other researchers argue for making portfolios and calculating returns to use September end (Agarwalla et al., 2013-09(05). They claim that unlike stocks in the USA, Indian stocks have their financial year end in March and the Companies Act 2013 gives a period of holding annual general meeting within six months. Hence, the true effect of the financial information of a particular financial year ending by March 31 can be seen in prices by September. A similar argument is made by (Gregory et al., 2009) for the UK market following the lead of (Agarwal and Taffler, 2008) for the market. We check for performance of these portfolios across all quarter of the years i.e., March end, June end, September end and December end to provide a conclusive result for this debate.

To sum up, the primary objective of this study is to observe and to explain the time varying behavior of value anomaly in the Indian stock market. We set the following objectives: First, study the impact on return differential when the value portfolios and growth portfolios are constructed at the end of different quarters. Second, examine the impact of different holding periods of the portfolios on these return differentials. Third, explore whether controlling for systematic risk and size impacts these differential returns across portfolio formation dates and holding periods.

The rest of the paper is organized as follows. Section 2 presents a review of literature. Data and methodologies used are discussed in sections 3. Results and their discussion in context of literature are presented in section 4. Section 5 concludes this paper.

2 Literature Review

Academic interest and research relating to modeling of stock market behavior goes as back as early 1900s (Keynes, 1923), (MacCauley, 1925). It was eventually the simultaneous and independent works by (Treynor, 1961) and (Sharpe, 1964) on Capital Asset Pricing Model (CAPM) and works by (Fama, 1965) and (Roberts, 1967) on market efficiency that truly solidified the acceptance of Efficient Market Hypothesis (EMH) as the primary theory for explaining the behavior of stock markets. This belief only gained more strength in the upcoming time periods with further works by (Jensen, 1968; Fama et al., 1969; Fama, 1970; Scholes, 1972; Jensen, 1978) providing further evidence for the hypothesis.

As widely held as the support for EMH was in the mid-1900s, there were a few studies that concluded results that were in departure from the stock price behavior as theorized by EMH. Significant works by (Ball, 1978; Basu, 1977) and (Banz, 1981), all pointed out the inefficiencies in the market that afforded the investors the potential for making abnormal gains in the market. Ball catalogued the effects of an earnings announcement; Basu noted the outperformance of low P/E stocks vis-a-vis the high P/E stocks over the 1956-71 period and Banz famously concluded the superior performance of small firm vis-à-vis the large stocks on the New York Stock Exchange.

There was stream of studies in the late 1980s that all found some form of inefficiency in the market. (De Bondt, 1985) found evidence of stock market overreaction, (Fama and French, 1988) found large negative autocorrelations,(Poterba and Summers, 1988) showed positive autocorrelation over short periods and negative autocorrelation over longer horizons. These studies were augmented and supported by studies done by (Lo and MacKinlay, 1988) and (Conrad and Kaul, 1988) which rejected random walk and characterized the stochastic behavior of expected returns respectively. These studies found further support in research that criticized the market efficiency concept through variance bound methodologies (Shiller, 1981).

However, it took the crash of 1987 for researchers to start taking these anomalies seriously. This accompanied with studies that concluded that information dissemination, consumption and processing had lags and unjustified returns big enough to point to market inefficiency (Cutler et al., 1989), (Eun and Shim, 1989). It was also noted that the cost of information may have also been a factor in making the markets informationally inefficient (Grossman and Stiglitz, 1980).

Further works of 1990s truly established the existence of these anomalies. Chopra et al. found evidence of overreaction in markets even after controlling for systematic risk and size (Chopra et al., 1992). (Jegadeesh and Titman, 1993) found evidence of momentum strategies earning abnormal strategies. (Lakonishok et al., 1994) found evidence of value strategies yielding higher returns.

As the literature on existence of anomalies was developing, it was accompanied by research that was focused on finding the reason for the same. For our study, we focus primarily on the value anomaly i.e., stocks(portfolios) that have low price-to-book ratio outperform the stocks that have high price-to-book ratio. The price-to-book ratio had emerged as a major variable that was able to explain the cross section of returns significantly (Fama and French, 1992; Lakonishok et al., 1994) in the early 1990s and yet the reason for the same could not be agreed upon by the researchers. One side of literature led by (Fama and French, 1992), found it to be a proxy of risk and the other side led by (Lakonishok et al., 1994) argued that sub optimal behavior of investors and subsequent over and under reaction was the cause for the anomaly to exist.

Over and under reaction of the investors has arguably provided the biggest reason for criticism of EMH because in an efficient market persistent mispricing should not be able to exist under the laws of arbitrage. This long-term mispricing has evidence in the form of papers by (De Bondt, 1985) and (Jegadeesh and Titman, 1993), reporting divergence of prices from their fundamental values.

Specifically, for at least the last half century, the value anomaly has been one of the most fruitful factors in terms of returns in comparison to other factors like size (Arnott et al., 2020) and still the source of this anomaly remains debated upon. As much as the reason has been in contest, recently the anomaly has also started facing heat for the lack of performance of value strategies especially in the last decade.

Research done for Indian markets indicates that the three-factor model is better at explaining the cross section of returns than the traditional CAPM (Bahl, 2006; Connor and Sehgal, 2001). Research by (Agarwalla et al., 2013-09(05) also finds significant value returns but negative size returns in the Indian market. The work by (Paul and Karmakar, 2015), however, finds no evidence for value strategies in the Indian markets but they hold their portfolio for relatively smaller time periods starting from a quarter of a year to the maximum time of 2 years.

In this paper, we seek to study and explain the behavior of the anomaly in the Indian context by building portfolios that are held for at least one year and up to a maximum of 5 years.

Most studies have focused on one year buy and hold returns, and favor the month of June for portfolio formation. This ignores the effect of larger holding periods and portfolios formed at the end of months apart from June. This study aims to fulfill these two gaps in the literature. We form portfolios at the end of each month and calculate returns for relatively longer time period of up to five years. This allows us to explore the nature of the value anomaly for different portfolio start dates and holding periods, which erstwhile has remained untouched in the studies done on the Indian markets.

In addition, we adjust portfolio returns for risk and size across all time domains, and offer a unique perspective into the behavior of the anomaly. Thus, this study makes several novel contributions to the literature on value anomaly and especially studies done on the Indian markets.

3 Data and methodology

Data for 1,543 stocks from CMIE prowess form the sample for this study. For these stocks, month end data comprising stock price, price to book multiple and market capitalization(size) was collected for the period of December 2008- December 2019. For purpose of our study, we calculate returns using the following formula -

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

Where, R_{t+1} is Return for the period t+1 and P_t and P_{t+1} are prices at time periods t and t+1 respectively. In the same manner, returns are calculated for portfolios.

Portfolios are made at the quarter-end of every quarter starting December 2008. The last five-year-holding period portfolio is made on December 2014 and the return on is calculated for the 5-year period ending at December 2019. We have calculated for the other portfolios in a similar fashion.

The stocks are sorted into growth and value stocks on the basis of their P/B multiple (descending order) and stocks with high P/B are classified as growth stocks and stocks with low P/B are classified as value stocks. Hence, the top decile with the highest P/B form the equi-weighted growth portfolio and the stocks with lowest P/B are in the bottom decile which form the equi-weighted value portfolio at all formation dates with 154 stocks in each portfolio of value and growth. (Table 1 shows the number of portfolios for each holding period and their time of formation).

Table 1. Summary of number of portfolios for different holding periods and formation dates

	Portfolio Holding Period and Formation dates				
	1 Year	2 Year	3 Year	4 Year	5 Year
First Portfolio Formation Date	31/12/2008	31/12/2008	31/12/2008	31/12/2008	31/12/2008
Last Portfolio Formation Date	31/12/2018	31/12/2017	31/12/2016	31/12/2015	31/12/2014
Number of portfolios	121	109	97	85	73

For every holding period, we test whether there is a significant outperformance of one portfolio over the other, across portfolio formation dates.

Welch's t-test was used to ascertain whether the portfolio returns were statistically different. This adaptation of Students' t-test does away with the assumption of homoscedasticity of the samples. The corresponding p-value for the Welch's t-statistic has been calculated and reported in this paper.

It has been argued that the value premium arises due to the inherent risk in the value stocks and it is only a reward for taking such higher risk (Fama and French, 1992). To explore this hypothesis, we form new value portfolios and growth portfolios after controlling for systematic risk. For this, first we calculate Beta of each stock using the following Single index Model by using 3-year monthly data of the stock returns.

$$R_i = \alpha_+ \beta R_m + \varepsilon_i \tag{2}$$

Once the beta is estimated, we calculate expected return for a stock using CAPM–

$$E(R_{it}) = R_{ft} + \beta * (R_{mt} - R_{ft}) \quad (3)$$

Where $E(R_{it})$ is the expected return for the i^{th} stock at time t, R_{ft} is the Risk-free rate at period t, which is yield on Government of India Bonds for the maturity matching with the holding period of the portfolio constructed, and Rmt is the rate of return of the market, proxied by BSE500 Index.

The difference of the actual return and the expected return is defined as the excess return. Value portfolios and growth portfolios are formed as discussed earlier with these excess returns, thereby controlling for the effect of systematic risk.

Literature also considers the relationship between size and the value anomaly (Loughran, 1997). We observe that in our data, value portfolios are dominated by small size[1] stocks (53% of portfolio) whereas growth portfolios are dominated by large size stocks (62% of portfolio).

After controlling for systematic risk, this study also controls for the size effect while calculating excess returns. The stocks were sorted on the basis of their size (in a descending order) in deciles and average returns for each decile were calculated. So, size adjusted returns are given by -

$$R_{sa} = R_{it}{}^{*} - \overline{R}_{d} \quad (4)$$

Where, R_{sa} is the size adjusted return of the stock, $R_{it}*$ is the excess return of the stock estimated using CAPM and $\overline{R}_{d}$ is the average return of the size decile that the stock belongs to.

4 Results and Discussions

This section is divided into three sub-sections. The first sub-section focusses on raw value-growth portfolio return differentials, followed by differentials controlled for systematic risk in sub-section 2, and finally, with a further control for size in sub-section 3.

4.1 Raw Returns

For the purpose of this study, 121 - one year holding period, 109 - two year holding period, 97 - three year holding period, 85 - four year holding period and 73 - five year holding period portfolios were constructed. It is observed that as the portfolio holding period increases, the relative proportion of portfolios displaying significant return differential between growth portfolios and value portfolios decreases. 62% of the one year holding portfolios have a significant return differential that falls down across the holding periods to almost 33% for the four-year holding periods, followed by a surge up to 40% in the five-year holding period.

The proportion of significant return differential portfolios where value portfolios outperform growth portfolios increases as we move from a one year holding period portfolio to a five-year holding period portfolio. The portfolios where value portfolios outperforms growth portfolios forms 46% of the significant return differential portfolios for the one year holding period and increases up to 86% for the five-year holding period. The one year holding period emerges as the worst performing time period for value portfolios. These portfolios see a minor dip in percentages for the three-year holding period but recover for four- and five-year holding periods. (See Table 2, Figure 1(a)).

Table 2. Summary statistics of portfolios of all holding periods

Portfolio Statistics (Raw Returns)	Portfolio Holding Period				
	1 Year	2 Year	3 Year	4 Year	5 Year
Number of Portfolios	121	109	97	85	73
Number of portfolios with significant return differential	75	59	40	28	29
Percentage of Significant Portfolios	61.98%	54.13%	41.24%	32.94%	39.73%
Significant-value	35	34	22	22	25
Significant-growth	40	25	18	6	4
Significant-value %	46.67%	57.63%	55.00%	78.57%	86.21%
Significant-growth %	53.33%	42.37%	45.00%	21.43%	13.79%

As the holding period increases, even though the number of cases where the value - growth return differential exists comes down, the proportion of cases where the value anomaly exists increases. Studies looking at short holding periods may find evidence both for and against the value anomaly, but longer holding periods provide stronger support to the value anomaly. Holding period thus seems to play a role in determining the strength of the anomaly.

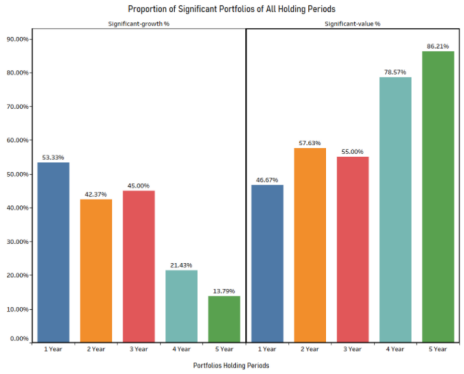
As mentioned previously, we focus specifically on quarter end portfolios, the details of portfolio formation month,

1 Size is measured using Market Capitalization.

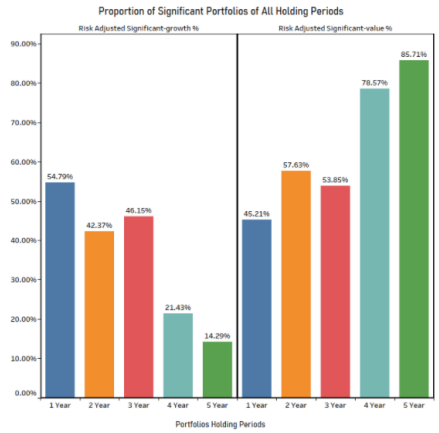
holding period and return differential is presented only for quarterly portfolios in Table 3. As can be seen in Table 3, value portfolios formed from December 2012 to the first quarter of 2016, have consistently outperformed growth portfolios. The year 2013 was especially interesting to study as value portfolios formed in that year, across holding periods, outperformed growth portfolios. The reason could be the slow down experienced by the Indian economy in the first half of 2012-2013 with the growth rate at 5.4%, a decline from 7.3% in the first half of 2011-2012[2].

After a brief dry spell in the middle part of 2014, the value portfolios were back on track of superior performance albeit for only portfolios with shorter holding period of 1-2 years till March 2016. We can see that post March 2016, the value portfolios all but vanish from portfolios with significant return differentials and growth portfolios outperform value portfolios.

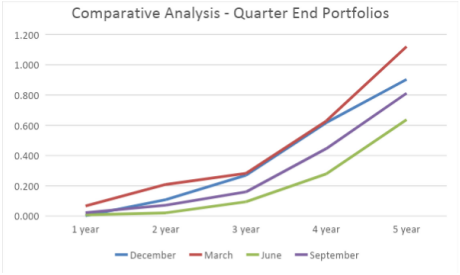
It is also interesting to note that out of all quarter ends, value portfolios formed in December end and March end consistently do better than portfolios formed in the rest quarter ends, across almost all holding periods. India follows an April-March financial year and typically academicians have focused on June end portfolios or September end portfolios. They choose amongst these two by choosing a three month or six-month period, after the financial year closing, to account for dissemination of all financial data regarding previous financial year. Our observations suggest that the value anomaly is stronger for December portfolios in comparison to June and September (Figure 1(c)). It can be argued that the number of portfolios exhibiting significant return differential during the months of June and September is lower because of the attention given to these months by the academics and consequent activity of informed traders in the Indian stock markets as the companies come out with the declaration of their annual financial results.



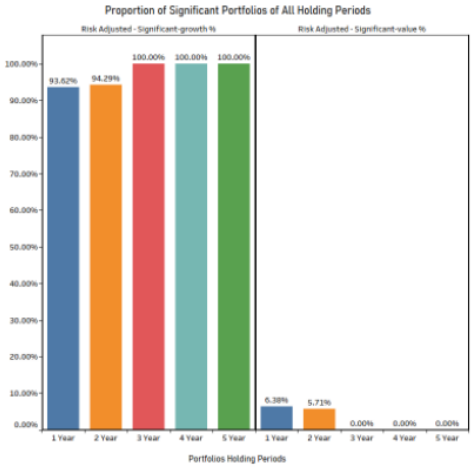
(a) Proportion of significant growth portfolios and value portfolios across holding periods



(b) Proportion of significant growth portfolios and value portfolios across holding periods



(c) Average Raw return differential for all quarter end portfolios



(d) Proportion of significant growth portfolios and value portfolios across holding periods

Figure 1. Portfolios across holding periods

2 Mid-Year Economic Analysis 2012-2013, Ministry of Finance.

Table 3. Value & Growth portfolio raw returns Differential

Portfolio Formation Dates (Quarterly)	Differential Return for Holding Period				
	1 Year	2 Year	3 Year	4 Year	5 Year
Mar-09	0.67*	0.69*	0.36	0.23	0.81
Jun-09	0.31*	0.13	0.06	-0.23	0.39
Sep-09	0.20*	0.17	0.11	0.07	1.23
Dec-09	0.11	0.14	0.04	0.16	0.99
Mar-10	-0.11	-0.16	-0.20	0.11	1.39
Jun-10	-0.18*	-0.14	-0.28*	0.00	0.08
Sep-10	-0.03	-0.14	-0.25*	0.43	0.95
Dec-10	-0.12*	-0.18*	-0.15	0.48	1.38
Mar-11	-0.12*	-0.18*	0.00	0.32	1.04
Jun-11	-0.08	-0.23*	0.03	-0.18	0.61
Sep-11	-0.08	-0.22*	-0.01	0.12	0.79
Dec-11	-0.06	-0.12	0.04	0.81*	1.11*
Mar-12	-0.17*	-0.30*	-0.46*	0.44	1.31*
Jun-12	-0.20*	0.02	-0.12	0.62	1.30*
Sep-12	-0.18*	-0.08	-0.13	0.34	0.71
Dec-12	-0.25*	-0.17	0.66*	0.57*	1.23*
Mar-13	-0.23*	-0.28	0.25	0.96*	1.21*
Jun-13	0.56*	0.22	0.89*	1.56*	1.63*
Sep-13	0.70*	0.56*	1.36*	2.33*	1.56*
Dec-13	0.27*	0.83*	1.14*	2.41*	1.08*
Mar-14	0.09	0.89*	1.40*	1.86*	0.96*
Jun-14	-0.44*	-0.11	0.15	0.29	-0.19
Sep-14	-0.23*	0.15	0.33	0.09	-0.37
Dec-14	0.22*	0.42*	0.78*	0.20	-0.37*
Mar-15	0.25*	0.81*	0.79*	0.48*	
Jun-15	0.23*	0.41*	0.24	-0.11	
Sep-15	0.17*	0.44*	0.19	-0.26*	
Dec-15	0.14*	0.41*	-0.01	-0.31*	
Mar-16	0.35*	0.45*	0.12		
Jun-16	0.11	0.05	-0.21		
Sep-16	0.05	0.00	-0.32*		
Dec-16	0.24*	-0.08	-0.34*		
Mar-17	0.01	-0.04			
Jun-17	-0.10	-0.16			
Sep-17	-0.07	-0.23*			
Dec-17	-0.15*	-0.27*			
Mar-18	-0.07				
Jun-18	-0.13				
Sep-18	-0.30*				
Dec-18	-0.37*				

"*" - indicates t-test is significant at 5% and null hypothesis of no difference in average returns is rejected. A positive number represents value portfolio outperforming growth portfolio and a negative number represents growth portfolio outperforming value portfolio.

4.2 Risk Adjusted returns

We observe that post controlling for risk, the pattern of number of portfolios with significant return differentials declining with percentage of value significant portfolios increasing, holds as before. Almost 60 % of 1 year holding portfolios show significant differential and out of these portfolios, the value portfolios form 45%. The percentage of significant portfolios goes on to decrease to 38% and value portfolios form 85% of these portfolios for 5 year holding period. (Table 4, Figure 1(b)).

Table 4. Summary statistics of risk adjusted portfolios for all holding periods

Portfolio Statistics (Risk Adjusted Returns)	Portfolio Holding Period				
	1 year	2 years	3 years	4 years	5 years
Number of Portfolios	121	109	97	85	73
Number of portfolios with significant return differential	73	59	39	28	28
Percentage of Significant Portfolios	60.33%	54.13%	40.21%	32.94%	38.36%
Significant-value	33	34	21	22	24
Significant-growth	40	25	18	6	4
Significant-value %	45.21%	57.63%	53.85%	78.57%	85.71%
Significant-growth %	54.79%	42.37%	46.15%	21.43%	14.29%

Similar to raw return results, there is an inverse relationship between percentages of significant portfolios and value significant portfolios as the holding period goes from 1 to 5 years.

These results indicate that systematic risk does not explain the value anomaly, as still exists after controlling for systematic risk. Holding period is again an important factor, as percentage of value portfolios outperforming growth portfolios increase as holding periods increase from one year to five.

The comparison of quarter end formed portfolio returns paint a picture similar to that of raw returns. For the one year holding period, portfolios formed in December end show more support for the value anomaly as compared to those formed at other quarter ends.

A possible explanation for this December bias remains the same. Portfolios made in June or September do not provide as much support to the value anomaly (Table 5).

Table 5. Value & Growth portfolio risk adjusted differential return

Portfolio Formation Dates (Quarterly)	Differential Return for Holding Period				
	1 year	2 years	3 years	4 years	5 years
Mar-09	0.56*	0.70*	0.28	0.14	0.69
Jun-09	0.29*	0.13	0.05	-0.24	0.35
Sep-09	0.19*	0.18	0.11	0.08	1.23
Dec-09	0.11	0.14	0.04	0.16	0.99
Mar-10	-0.11	-0.16	-0.20	0.11	1.39
Jun-10	-0.18*	-0.14	-0.28*	0.00	0.09
Sep-10	-0.03	-0.14	-0.25*	0.43	0.95
Dec-10	-0.13*	-0.19*	-0.16	0.48	1.38
Mar-11	-0.12*	-0.18*	0.00	0.31	1.04
Jun-11	-0.08	-0.22*	0.03	-0.19	0.61
Sep-11	-0.08	-0.22*	-0.01	0.11	0.79
Dec-11	-0.06	-0.11	0.03	0.80*	1.10*
Mar-12	-0.17*	-0.30*	-0.47*	0.44	1.30*
Jun-12	-0.20*	0.03	-0.15	0.59	1.26*
Sep-12	-0.17*	-0.07	-0.16	0.30	0.65
Dec-12	-0.25*	-0.16	0.65*	0.56*	1.20*
Mar-13	-0.23*	-0.28	0.25	0.96*	1.21*
Jun-13	0.57*	0.21	0.91*	1.59*	1.66*
Sep-13	0.73*	0.54*	1.40*	2.37*	1.61*
Dec-13	0.28*	0.82*	1.15*	2.44*	1.10*
Mar-14	0.09	0.88*	1.41*	1.87*	0.97*
Jun-14	-0.44*	-0.12	0.16	0.30	-0.18
Sep-14	-0.23*	0.14	0.33	0.09	-0.36
Dec-14	0.22*	0.42*	0.79*	0.20	-0.37*
Mar-15	0.26*	0.81*	0.79*	0.48*	
Jun-15	0.24*	0.42*	0.23	-0.12	
Sep-15	0.17*	0.45*	0.17	-0.27*	
Dec-15	0.15*	0.43*	-0.02	-0.33*	
Mar-16	0.34*	0.46*	0.09		
Jun-16	0.09	0.07	-0.24		
Sep-16	0.05	0.01	-0.32*		
Dec-16	0.22*	-0.07	-0.36*		
Mar-17	0.00	-0.03			
Jun-17	-0.11*	-0.13			
Sep-17	-0.07	-0.22*			
Dec-17	-0.14*	-0.26*			
Mar-18	-0.07				
Jun-18	-0.13				
Sep-18	-0.29*				
Dec-18	-0.37*				

'"*" – indicates t-test is significant at 5% and null hypothesis of no difference in average returns is rejected. A positive number represents value portfolio outperforming growth portfolio and a negative number represents growth portfolio outperforming value portfolio.

4.3 Risk and Size adjusted returns

For the purpose of our study, we treat the stocks in the top three percentiles (of descending order size sort) as 'large' stocks and the bottom three deciles as 'small' stocks. We find that all value portfolios are comprised of at least 53% small stocks and all growth portfolios are comprised of at least 62% large stocks. Keeping this in mind, we discuss the results found for portfolios adjusted for risk and size. Unlike the adjustment for risk which arguably had negligible effect on the performance of portfolios, we find that once the portfolios have been adjusted for size as well, the value premium all but vanishes.

Portfolios with significant return differential hover around 44% for holding period up till 3 years and then decline to 36% for 4 year holding period and further to 24% in 5 year holding period. Value premium is only earned by 7 portfolios in total and even that vanishes as the holding period goes beyond 3 years. Interestingly enough, 4 out of 5 portfolios with

value premium were formed in late 2013, a time period that we have established as being extremely good for value strategy (Table 6, Figure 1(d)).

Table 6. Summary statistics of risk and size adjusted portfolios for all holding periods

Portfolio Statistics (Risk and Size adjusted returns)	Portfolio Holding Period				
	1 Year	2 Year	3 Year	4 Year	5 Year
Number of Portfolios	121	109	97	85	73
Number of portfolios with significant return differential	52	49	43	31	15
Percentage of Significant Portfolios	42.98%	44.95%	44.33%	36.47%	20.55%
Significant-value	6	1	0	0	0
Significant-growth	46	48	43	31	15
Significant-value %	6.38%	5.71%	0.00%	0.00%	0.00%
Significant-growth %	93.62%	94.29%	100.00%	100.00%	100.00%

As for performance of portfolios made at the end of quarters, the high percentage of significant portfolios made in December still holds its position in short period of one year and longer periods of holding in 4 and 5 years. The portfolios made in June are most significant for 2- and 3-year holding period (Table 7).

Table 7. Value & Growth portfolios risk and size adjusted return differential

Portfolio Formation Dates (Quarterly)	Differential Return for Holding Period				
	1 year	2 years	3 years	4 years	5 years
Mar-09	0.35	0.21	-0.06	-0.13	0.25
Jun-09	-0.07	-0.40*	-0.31*	-0.48*	-0.26
Sep-09	-0.16	-0.16	-0.14	-0.10	0.23
Dec-09	-0.12	-0.07	-0.09	0.07	0.17
Mar-10	-0.23*	-0.27*	-0.27*	0.01	0.56
Jun-10	-0.24*	-0.18*	-0.24*	-0.02	-0.54
Sep-10	-0.12	-0.17*	-0.26*	0.16	-0.01
Dec-10	-0.16*	-0.17*	-0.10	0.17	0.18
Mar-11	-0.12*	-0.16*	0.05	-0.05	0.04
Jun-11	-0.08	-0.15*	0.06	-0.67	-0.45
Sep-11	0.00	-0.12	-0.09	-0.53	-0.21
Dec-11	0.03	0.02	-0.30	-0.87*	-0.52
Mar-12	-0.14*	-0.22*	-0.77*	-0.66*	-0.59
Jun-12	-0.14*	0.04	-0.57*	-0.49	-0.59
Sep-12	-0.15*	-0.32*	-0.89*	-0.99*	-0.99*
Dec-12	-0.20*	-0.46*	-0.64*	-0.86*	-0.98*
Mar-13	-0.19*	-0.64*	-0.93*	-1.15*	-1.18
Jun-13	0.39*	-0.39	-0.42	-0.74	-0.40
Sep-13	0.35	-0.31	-0.19	0.05	-0.37
Dec-13	-0.09	-0.72*	-0.66*	-0.63	-0.84
Mar-14	-0.22	-0.22	-0.63	-0.62	-0.61
Jun-14	-0.62*	-0.74*	-0.99*	-0.77*	-0.87*
Sep-14	-0.40*	-0.36*	-0.44*	-0.54*	-0.62*
Dec-14	-0.23*	-0.23	-0.31	-0.39*	-0.50*
Mar-15	-0.09	-0.05	-0.22	-0.14	
Jun-15	-0.07	-0.27*	-0.38*	-0.47*	
Sep-15	-0.04	-0.01	-0.22	-0.39*	
Dec-15	0.06	0.17	-0.08	-0.19	
Mar-16	0.18	0.12	-0.04		
Jun-16	-0.06	-0.11	-0.24		
Sep-16	-0.06	-0.13	-0.29*		
Dec-16	0.11	-0.07	-0.21		
Mar-17	-0.06	-0.04			
Jun-17	-0.11	-0.06			
Sep-17	-0.09	-0.12			
Dec-17	-0.10*	-0.13			
Mar-18	0.00				
Jun-18	-0.02				
Sep-18	-0.14*				
Dec-18	-0.18*				

"*" - indicates t-test is significant at 5% and null hypothesis of no difference in average returns is rejected. A positive number represents value portfolio outperforming growth portfolio and a negative number represents growth portfolio outperforming value portfolio.

5 Conclusion

This study explores the dynamic behavior of the value anomaly in the Indian markets over the period - December 2008 – December 2019. We formed value portfolios and growth portfolios every quarter for different holding periods. The holding period for portfolios varied from a period of one year to five years, and the return differential amongst these portfolios was studied to capture the effect of time on the value anomaly in India. It is argued that these return differentials may be due to risk, and size of the underlying securities. Hence to filter out their effect, the returns were then controlled for systematic risk, and size of the stocks.

The results of portfolios with unadjusted returns show that significant return differential between the value portfolios and growth portfolios decrease with increase in holding period of these portfolios. 61.98% of one year holding portfolios exhibit a significant return differential. Whereas, this significant return differential is reduced to 39.73% for five year holding portfolios. Interestingly enough, out of these significant return differential portfolios, the percentage of value portfolios outperforming growth portfolios actually increase with increase in holding period. Only in 46.67% of the significant return differential portfolios, value portfolios outperform growth portfolios for one year holding period. This percentage almost doubles to 86.21% for the five-year holding period. This supports earlier literature that document sub optimal asset allocation of Indian markets and the tendency for investors to stick with continuation patterns of investment. The eventual increase in percentage of value significant portfolios is also expected as per literature as the investor takes time to revert to contrarian strategies in long term.

We also find the value portfolios formed from the end of 2012 to the end of 2013 showed significant and large outperformance over growth portfolios. This was a period of macroeconomic instability in India. This is in line with the prior studies which have observed a positive relationship between value premium and business recession periods (Guo et al., 2009).

Most Indian studies only explore performance of portfolios made in June or September. We study the behavior of portfolios formed at the end of all months and then focus on quarter end portfolios. We observe that value portfolio outperformance is stronger for March and December end formation dates. One of the reasons for outperformance of portfolios made in March can be attributed to the tax loss hypothesis, wherein investors sell off a relatively low performing stock to set off capital loss against other capital gains and hence potentially reduce taxes. This fact is more applicable in the context of small stocks (Ritter, 1988). Since most of our value portfolios are made up of small stocks, this de-loading of small stocks can make the price differential between value and growth stocks more pronounced at March end. It means that value stocks are cheaper to purchase and hence provide a potentially better opportunity to make profits, especially at March end.

Value portfolio outperformance patterns observed for raw portfolio returns do not change significantly when returns are controlled for systematic risk(beta). These results support studies in literature which posit that beta fails to explain cross section of results in emerging economies like India (Saji, 2014) The significant return differential portfolios still fall over time and value significant portfolios still increase over time. This is one of the major contributions of this study to literature as it highlights the uniqueness of Indian markets, where systematic risk is unable to explain neither the value anomaly nor a cross section of returns.

Controlling for size makes the value anomaly almost disappear, indicating that size has a role to play. It was found that value portfolios were predominantly composed of small size stocks, whereas growth portfolios were comprised of large stocks. These results find partial support literature. Value portfolios outside India also find dominance of small stocks in them but exhibit value premium even after adjustment for size (Lakonishok et al., 1994). But our study shows disappearance of value premium after adjustment for size in the Indian markets.

This research has significant implications for both academicians and practitioners. It highlights the unique features of the Indian markets and its impact on the value anomaly. Our findings show a direct link between value premium and long-term holding period of portfolios. The negligible effect of systematic risk but high sensitivity of returns to size deserves more exploration in the future. Further areas of research have been highlighted for future academic work. A link between distress risk and portfolio returns can be explored as the return of portfolios could be driven by fundamental factors. Also, the failure of systematic risk to explain the value anomaly in India indicates a behavioral finance linkage, as it seems that investors are willing to pay a premium for growth stocks which do not outperform value stocks.

Practitioners can use this study to optimize portfolio formation dates for trading strategies exploiting the value anomaly. They can also explore whether a small-value portfolio will outperform a large-growth portfolio on a larger scale than just a value – growth pair.

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