# Value Anomaly or Value Premium? An Innovative Approach to Examining Risk-Return Profiles Using Discriminant Analysis

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**Abstract**

We examine whether the economic law of one price is upheld in the Indian capital market or not. Exponents of Efficient Market Hypothesis dictate equality between risk and return by inferring the risk from the realized returns. However, at the investor's level what matters more is whether the return is proportionate to the risk actually experienced or not. This paper examines that aspect with four distinctions. The most important of them is the application of discriminant analysis to examine how far the value stocks and growth stocks portfolios are discriminated by their risk-return profiles. Amidst the absence of unanimity, our study conclusively proves that value stocks have outperformed growth stocks in terms of risk adjusted return in India. Thus, developing economy like India shares this pricing anomaly commonly with other developed economies. Our findings have direct implications on retail investors as well as asset management companies for their portfolio formation.

**Keywords:** Value stocks, Growth stocks, Value anomaly, Price-to-Book value ratio, Discriminant Analysis

## Introduction

In the context of capital market, stocks having low price multiple are classified as value stocks, whereas those with higher price multiple are identified as growth stocks. Most of the empirical studies conducted the world over have found that the value stocks give higher returns in comparison to growth stocks[i]. However, on the count of its justifiability, the scholars are divided into two groups. The exponents of efficient market theory, popularly known as the conformists, support it by designating it as 'value premium'; whereas the contrarians, popularly identified with behavioural school, prefer to label it as 'value anomaly'[ii]. Irrespective of the lens that one uses to look at it, the fact remains that the value stocks command higher returns in comparison to the observed risks. Starting with Fama and French (1992) who studied the cross-section of returns, scholars have examined the issue of value anomaly from many different aspects using varied methodological tools. Depending upon the aspects examined and the tools employed, the results tend to lean towards either the Efficient Market Hypothesis (EMH), or its diagonally opposite paradigm of Behavioural Hypothesis. Thus, the issue continues to remain open for further empirical investigations.

The school led by Fama-French seems to be searching for explanations to all pricing anomalies like value anomaly, size anomaly, etc. by looking at them from the lens of EMH. Taking the premise that the market is efficient, they argued that any excess return on low Price-to-Book stocks must be taken as extra risk-premium. Instead of probing more into it, Fama and French (1992) simply called it as a fundamental risk premium in their pioneering work. Later, following the suit, like many other scholars, Chen and Zhang (1998) argued that the difference in returns is due to the differences, in structural characteristics between the two groups of stocks, and articulated financial distress, earnings uncertainty, and financial leverage as the distinguishing characteristics of value stocks. Against this, Bouchaud et al. (2016) argued that the reason for value anomaly lies in the behavioural aspect manifested in systematically underestimating the future return of high-quality firms, compared to low-quality firms by the analysts.

Given the diagonally opposite arguments under the two schools of thought, we have designed this research to explore whether the extra risk factors as contemplated by the conformists really show up at the investor level in terms of increased risk with value stocks. Our contention with the conformists' arguments is quite simple and straight forward. We say that if there are extra risks in any form, finally that must get reflected, at least over a longer period, in higher volatility in returns. Therefore, taking a long period of sixteen years, we aim at examining whether the excess return is coupled really with proportionately the higher risk or not in Indian stock market. This calls for measuring the actually experienced risk by the investors in the two portfolios of value stocks and growth stocks. Normally, scholars have been using Sharpe ratio for this purpose. However, being a composite measure of performance, it does not facilitate to compare the levels of return and risk, separately. Therefore, we opt for examining the risk-return relationship separately by using two-group Discriminant Analysis, which can clearly show the specific influences of return and risk in the two portfolios[iii]. Towards that, the portfolios are created using Price-to Book value ratio[iv].

## Literature Review

We review only selected few research in this field that are relatively recent.

### Studies pertaining to developed markets

There have been many studies conducted in developed markets which found that value stocks outperformed growth stocks in terms of raw return as well as risk-adjusted return (Capaul et al., 1993;Lakonishok et al.,

1994;Brouwer et al., 1997, Bauman and Miller, 1997;Doeswijk, 1997; Porta et al., 1997; Arshanapalli et al., 1998; Bauman et al., 1998. Dhatt et al., 1999; Oertmann (2000),Dimson et al., (2003) studied the U.S. market for the period of 1955 to 2001. The results showed the existence of value anomaly. Dunis and Reilly (2004) studied the U.K. market for the period from 2000 to 2002 and found a statistically significant higher return on all value portfolios. Yen et al., (2004) examined the value anomaly in the Singapore stock market for the years 1975 to 1997 and documented that the value anomaly was majorly concentrated in the first two years after the formation of the portfolio suggesting a mean reversion of returns. Ding et al., (2005) studied the stock markets of Japan, Indonesia, Thailand, Hong Kong, Taiwan, Singapore, and Malaysia for the same period from 1975 to 1997. The study concluded the existence of value anomaly in Japan, Hong Kong, Singapore, and Malaysia. The Canadian stock market was studied by Athanassakos (2009) for a period of 20 years spanning from 1985 to 2005. The study documented the existence of value anomaly. Further, the result was found consistent in different market conditions such as bullish, bearish, recessions and recoveries. Gharghori et al., (2013)examined the performance of value strategies and growth strategies for the Australian stock market for the period of 1993 to 2004. The study concluded the presence of a strong value effect.

### Studies pertaining to emerging markets

Anderson et al. (2003) also found excess return on value stocks in Mongolia for the period of 1992 to 1995, which could not be explained by the risk factors; rather they were partially explained by the liquidity effect. Gonenc and Karan (2003) studied the value anomaly in the Istanbul Stock Exchange for the period of 1993-1998. Just opposite to other researches, they found that growth stock portfolios provided superior returns than value stock portfolios. Additionally, the average returns on value stock portfolio and growth stock portfolios were not sensitive to market fluctuations. Likewise, Kyriazis and Diacogiannis (2007) studied the presence of value anomaly in the Athens Stock Exchange for the period of 1995 to 2002. The result provided little support to the argument of value stock portfolio outperforming growth stock portfolio. Later on, Senthilkumar (2009) estimated the relationship between expected stock returns with the size and Price-to-Book value ratio of selected Indian companiesfor the period from April 2002 to March 2008. The study found a significant Price-to-Book value effect in all the groups of study. Tripathi (2009) studied the issue of value anomaly in the Indian stock market and found the presence of a significant positive relationship between Price-to-Book ratio and

equity returns for the considered period of June 1997 to June 2007. Singh and Kaur (2015) examined the relevance of fundamental strategy based on accounting information in identifying the right set of value stocks in the Indian stock market from 1996 through 2010. The study concluded that the mean market-adjusted return of stocks was significantly higher than the return on the portfolio of value stocks. Thus, it negated the presence of any value premium.Akhtar (2017) studied the robustness of the Fama-French three-factor model in the Indian market from 1993 to 2013. The study concluded that high book-to-market equity stocks outperformed low book-to-market equity firms.

## Our Approach

Though, there have been some studies on value anomaly in emerging economies, in general and India in particular, no clear evidence for or against the existence of value anomaly or value premium is documented. More than that, relating the level of return to the level of risk seems to be a grey area. Likewise, there have not been any studies based on a larger timeframe that would cover different states of the economy. All previous studies formed only one set of the portfolio, mainly based on upper and lower tails of Price-to-Book ratio, or for that matter, any other value growth indicator. These observations offer us an opportunity to add value by conducting our research with the following four distinctions.

·The standard approach, so far, for relating the level of return to the level of risk has been to use Sharpe ratio. However, being a composite measure, it fails to present comparative pictures of returns and risks, separately. Of course, the t-Test would do that job, but it confines to handling the parameter of only the return. Therefore, we have chosen to use Discriminant Analysis which is capable of showing and analysing the individual effects of both risk and return in terms of their ability to discriminate between the value stocks and growth stocks portfolios.

·We take relatively a longer period of sixteen years spanning over 2003-04 to 2018-19. As far as Indian capital market is concerned, going by BSE 500 Index, it covers expansionary phase (from April 2003 to December 2007), then a sudden downturn (during January 2008 to February 2009), then the subsequent recovery phase (during March 2009 to March 2016), and then again an expansionary phase (during April 2016 onwards). This would help us understand the phenomenon of value anomaly in different states of economy.

·Since the Discriminant Analysis is a novel approach to this kind of study, we need to validate its application. Therefore, we opt for constructing three pairs of portfolios

as elaborated later. Towards that, the stocks are arranged in the ascending order of their Price-to-Book value ratio. Then, Pair-I is constructed by bifurcating the companies into two groups of above the median and below the median, resulting into a value stock portfolio and a growth stock portfolio, respectively. The other two pairs of portfolio are formed taking extreme observations based on tercile and quartile in order to sharpen the effect of the discriminating variable. The validation of our approach would require a successive increase in the explanatory power of Discriminant Analysis when we progress from median-based grouping to quartile based grouping.

·Normally, such studies are based on an analysis of holding period performance. Accordingly, we analyse performance over sixteen different holding periods starting with one year and stretching up to sixteen years. At the same time, we also opt for examining year-wise performance for all sixteen years.

With the above-mentioned specifications, we formulated our research question as: Do value stocks outperform growth stocks after controlling for the associated risk in the Indian stock market?

## Research Methodology

### The Sample

The data are taken from Ace-Equity database marketed by Accord Fintech Pvt. Ltd., and the website of BSE (www.bseindia.com). The sample is drawn from S&P BSE 500 index, which covers all major industries and represents nearly 93% of the total market capitalization on the Bombay Stock Exchange. The following filtering criteria are applied to avoid any distortions in the data to make the analysis and conclusion more robust.

I.Banking companies and NBFCs are excluded from the study due to their very different nature of business and leverage. (For example, see Fama and French, 1992)

II.Only those companies are considered whose data are available for the entire period of 1st April 2003 to 31st March 2019. Further, for the purpose of parity, only those companies are included which close their accounts on 31st March.

III.Companies with zero and negative book values are excluded from the study.

IV.The companies with irregular trading are discarded to avoid surprises.

### Portfolio Formation

Total 187 companies satisfied all the above-mentioned requirements. Adopting the buy and hold strategy, three

pairs of portfolios are set up based on the Price-to-Book value ratios of those 187 companies on 31st March 2003. That is, in cases of Pair-II and Pair-III, all the 187 companies are not considered. Rather, Pair-II is formed by considering only the top tercile and the bottom tercile companies as value stock portfolio and growth stock portfolio, respectively. Likewise, Pair-III is formed by considering only the top quartile and the bottom quartile companies as value stock portfolio and growth stock portfolio, respectively. As a result, Pair I, Pair II and Pair III contain 93, 62 and 47 companies in value and growth portfolios, respectively.

**Definitions of Terms Used**

Year-wise Return: The return of a stock is measured for each year that comprised of the capital appreciation as well as the dividends distributed by the company. Accordingly, daily returns are calculated, using adjusted daily closing prices, for the financial year starting from 1st April and ending on 31st March. Next, the arithmetic average of daily returns is calculated for each year. Then, the effective return for the year is calculated by using the following formula.

$$Year - wise \quad Return \ = (1 + r)^n - 1$$

Where,

r = average of daily return during the year

n = number of trading days in the year

Holding Period Return: It is calculated as geometric mean of yearly returns during the period.

Risk: The risk of a stock is measured by calculating the

standard deviation of daily returns annualised for a given year.

Price-to-Book value ratio: Price-to-Book value ratio is the most popular financial indicator in such studies. We calculate the Price-to-Book value ratio as shown below.

$$Price\text{-}to\text{-}Book \ value \ ratio = \frac{Close \ price \ (as \ on \ year \ end)}{Book \ value \ per \ share}$$

**Data Analysis and Results**

The descriptive statistics pertaining to the returns are

presented in Table 1.

**Table 1: Descriptive Statistics of Return**

| Particulars | Pair I | | Pair II | | Pair III | |
|---|---|---|---|---|---|---|
| | Value Stock | Growth Stock | Value Stock | Growth Stock | Value Stock | Growth Stock |
| Mean | 0.72 | 0.46 | 0.79 | 0.46 | 0.83 | 0.49 |
| Median | 0.67 | 0.44 | 0.7 | 0.44 | 0.76 | 0.45 |
| Minimum | -0.01 | 0.04 | 0.3 | 0.07 | 0.3 | 0.17 |
| Maximum | 2.04 | 0.91 | 2.04 | 0.91 | 2.04 | 0.91 |
| Range | 2.05 | 0.86 | 1.73 | 0.83 | 1.73 | 0.74 |
| Standard Deviation | 0.35 | 0.2 | 0.35 | 0.2 | 0.37 | 0.19 |

*Source: Compiled by authors*

A cursory glance at the mean and median values of return reveals that the value stock portfolios command higher returns. Therefore, now we examine using t-Test whether the differences in returns of the two portfolios of stocks are statistically significant or not. Towards that, first we checked for the normality of the return data using the Kolmogorov-Smirnov test of normality. The results are presented in Table 2.

### Table 2: Kolmogorov-Smirnov Test of Normality

| Pairs | Particulars | K-S Statistic | df | Significance level |
|---|---|---|---|---|
| **Pair I** | Value Stock | 0.08 | 93 | 0.18 |
| | Growth Stock | 0.09 | 93 | 0.09 |
| **Pair II** | Value Stock | 0.12 | 62 | 0.02 |
| | Growth Stock | 0.1 | 62 | 0.2 |
| **Pair III** | Value Stock | 0.14 | 47 | 0.03 |
| | Growth Stock | 0.15 | 47 | 0.01 |

*Source: Compiled by authors*

Since the risk data are derived from the return data which are satisfying the normality condition at 1% significance level, there is no case for examining the normality of risk data. Now we focus on finding whether there is a significant difference between the returns of two groups of portfolio, the t-Test happens to be the major tool of analysis. (Capaul et al., 1993; Singh and Kaur, 2015). As a prelude to the t-Test, we conduct F Test, to decide as to which version of t-Test should be used. Since F Test reveals significant differences in variances in the two groups, the t-Test is conducted on the premise of unequal variances. Then, acknowledging the fact that the significant differences in return may be partly or solely due to the difference in risks, at the second stage, Discriminant Analysis is employed to clearly bring out how far the levels of risk in the two portfolios are explaining the levels of their returns. The analysis is conducted on the year-wise basis as well as on the basis of holding periods.

**Analysis of Difference in Returns Using t-Test**

First, the differences in return were analysed on year-wise basis using t-Test. Barring only few exceptions, for most of the years the returns of value stock portfolios were found significantly higher than that of growth stock portfolios. The results are not reported here for the want of space.

The analysis of differences in the holding period returns is presented in Table 3.

### Table 3: t-Test of Holding Period-wise Mean Returns Assuming Unequal Variances

| Particulars | Pair I | | Pair II | | Pair III | |
|---|---|---|---|---|---|---|
| | *Value Stock* | *Growth Stock* | *Value Stock* | *Growth Stock* | *Value Stock* | *Growth Stock* |
| 1 year | 2.11% | 1.75% | 2.20% | 1.73% | 2.23% | 1.70% |
| t Value | 1.42* | | 1.51* | | 1.43* | |
| 2 years | 7.43% | 3.39% | 8.72% | 3.38% | 8.95% | 3.60% |

| | | | | | | |
|---|---|---|---|---|---|---|
| t Value | 5.27*** | | 5.15*** | | 4.59*** | |
| 3 years | 22.82% | 7.56% | 26.97% | 7.43% | 28.56% | 7.93% |
| t Value | 5.33*** | | 5.04*** | | 4.47*** | |
| 4 years | 29.87% | 9.82% | 36.21% | 9.82% | 38.99% | 10.61% |
| t Value | 3.82*** | | 3.56*** | | 3.08*** | |
| 5 years | 52.58% | 13.63% | 64.02% | 13.64% | 70.84% | 14.34% |
| t Value | 3.14*** | | 2.80*** | | 2.45*** | |
| 6 years | 22.87% | 8.85% | 24.87% | 9.10% | 24.79% | 9.52% |
| t Value | 3.51*** | | 3.07*** | | 2.72*** | |
| 7 years | 94.89% | 23.43% | 112.76% | 24.15% | 110.98% | 25.28% |
| t Value | 3.72*** | | 3.25*** | | 2.93*** | |
| 8 years | 113.52% | 30.44% | 138.48% | 33.26% | 149.65% | 35.88% |
| t Value | 3.29*** | | 2.88*** | | 2.47*** | |
| 9 years | 120.46% | 34.15% | 151.22% | 39.12% | 168.00% | 43.63% |
| t Value | 2.71*** | | 2.40*** | | 2.05** | |
| 10 years | 119.33% | 41.46% | 152.44% | 48.23% | 170.48% | 54.61% |
| t Value | 2.20** | | 1.99** | | 1.70** | |
| 11 years | 171.11% | 63.13% | 222.69% | 72.97% | 244.41% | 80.88% |
| t Value | 2.67*** | | 2.54*** | | 2.20** | |
| 12 years | 315.63% | 108.64% | 406.60% | 123.30% | 443.82% | 128.54% |
| t Value | 3.25*** | | 3.08*** | | 2.86*** | |
| 13 years | 365.91% | 115.53% | 473.06% | 128.81% | 502.76% | 133.32% |
| t Value | 3.34*** | | 3.18*** | | 2.90*** | |
| 14 years | 598.27% | 158.85% | 776.33% | 176.27% | 840.57% | 183.11% |
| t Value | 3.76*** | | 3.57*** | | 3.24*** | |
| 15 years | 874.11% | 193.80% | 1169.37% | 219.50% | 1294.33% | 237.69% |
| t Value | 3.78*** | | 3.65*** | | 3.29*** | |
| 16 years | 936.66% | 210.61% | 1264.45% | 244.49% | 1388.77% | 275.40% |
| t Value | 3.51*** | | 3.40*** | | 3.02*** | |

*Source: Compiled by authors*

* Significant at the 10 percent level

** Significant at the 5 percent level

***Significant at the 1 percent level

As far as the results of holding period-wise returns are concerned, Table 3 is quite eye-catching. It can be seen that except in the first year, the returns on value stocks are significantly higher than that on growth stocks. It is clear that the cumulative returns on value stocks are higher throughout the different holding periods starting from a holding period of two years to that of sixteen years. Two points are worth noting here. One, the first year is an exception, and two, both F statistic and t Value go hand in hand for different holding periods. As far as the 'first-year phenomenon' is concerned, it is quite obvious that it reveals the concept of the gestation period. More important is the

second point, which makes it amply clear that the higher return on value stocks is coupled with higher risk. This requires a further investigation to know whether the higher return on value stock portfolios has proportionately higher risk, or otherwise. Therefore, after analysing the raw returns, now we attempt to study the effect of risk on the returns with the help of Discriminant Analysis.

**Analysis Using Discriminant Analysis**

The Discriminant Analysis is conducted on the average yearly returns for the holding period of sixteen years. The results of Discriminant Analysis are compiled in Table 4.

### Table 4: Summary of Discriminant Analysis Results

| Particulars | Criterion | Pair I | Pair II | Pair III |
|---|---|---|---|---|
| Mean Values for Value Stock Portfolio | Return | 0.718 | 0.786 | 0.827 |
| | Risk | 1.249 | 1.341 | 1.405 |
| Mean Values for Growth Stock Portfolio | Return | 0.464 | 0.463 | 0.491 |
| | Risk | 0.769 | 0.761 | 0.796 |
| Standardized Canonical Discriminant Function Coefficients | Return | 0.887 | 1.184 | 1.274 |
| | Risk | 0.128 | -0.217 | -0.328 |
| Structure Matrix Coefficients | Return | 0.998 | 0.994 | 0.987 |
| | Risk | 0.896 | 0.817 | 0.783 |
| Canonical Correlation | | 0.409 | 0.496 | 0.506 |
| Classification Result (correctly classified) | | 67.70% | 70.20% | 71.30% |

*Source: Compiled by authors based on SPSS 21 output*

The test of equality of group means shows a significant difference in both_ return as well as risk_ between the two groups in all the three pairs. Since there is only one discriminant function, the canonical correlation in all the three pairs can be interpreted as suggesting a fairly good model fit. The Standardized Canonical Discriminant Function Coefficients show that the return has more explanatory power than risk, which casts its vote for designating the excess returns on value stocks as 'value anomaly'. It should be noted that in all the three pairs, the returns positively explain the discriminant function. Further, the coefficient value of the return is increasing gradually while moving from median-based classification

to quartile-based classification, which validates the relevance of Discriminant Analysis. The betas of risk have negative signs (except for the median-based classification, which is not a sharp classification), which shows that the risk is inversely related to the value of the portfolio. Further, the magnitude of negative beta coefficients of risk is increasing gradually, which conforms to the theory. This can be interpreted as suggesting that the tercile and quartile based classifications are more reflective of the return-risk relationship than the median-based classifications. It is interesting to highlight that with classification getting sharper (that is, with moving away from median-based and going progressively to quartile-based classification), the

explanatory power of discriminant function increases from 67.7% to 71.3%, which validates the application of Discriminant Analysis for capturing the effects of return and risk separately, as well as the notion of value anomaly. Further, these results not only confirm the theory that value is a positive function of return and an inverse function of risk but also validate the intuition behind forming the groups based on the Price-to-Book value ratio. The structure matrix table shows that both return and risk are important variables. Thus, it is evident that there is a significant difference between the returns controlled for the associated risks of all three pairs of the portfolio. Put another way, the value stock portfolios generate excess return even after factoring for the associated higher risk. In conclusion, these results unequivocally prove the existence of value anomaly in the Indian market.

## Findings

Our analysis shows that the cumulative returns on value stocks are higher throughout the different holding periods, staring from a holding period of two years to that of sixteen years. Here, justifiably, the first year is an exception, which can be seen as nothing but the manifestation of the concept of the gestation period. It gives a clear message to investors that if they are inclined to form a portfolio of value stocks, then the lock-in period should be a minimum one year. Since our period of sixteen years covers expansionary, recessionary and recovery periods in the Indian stock market, it turns out that the performance of value stocks portfolio is independent of the state of the economy.

Another noteworthy point is that for both the portfolios, the increase in computed values of both_ the return and the risk go hand-in-hand. This is in the conformity of the theory that higher returns are coupled with higher risks. However, the disproportionately higher returns, for the given level of risk, on value stock portfolio as revealed in the Discriminant Analysis questions the EMH and the associated risk-based hypothesis. It is noteworthy that the Standardized Canonical Discriminant Function Coefficients show that the return has more explanatory power than the risk. It should be noted that in all the three pairs, not only that the return positively explains the discriminant function, but the coefficient value of the return is increasing gradually while moving away from median-based classification to quartile-based classification. These observations validate the intuition behind forming three pairs of portfolios based on the Price-to-Book value ratio.

## Discussion and Conclusions

Excess return on value stocks as contrasted to growth stocks is a matter being extensively researched world over for understanding the chemistry of their return and risk profile. Therefore, while developing risk-return profiles of value stock portfolio and growth stock portfolio, we cautiously take a conservative approach by analysing daily returns that would not allow any overestimation of return and underestimation of risk in case of value stocks. However, even with that, when dissected for understanding the chemistry of the excess returns using Discriminant Analysis, it turned out that value stocks have outperformed the growth stocks in the Indian stock market. Thus, it is convincingly proven that the excess return on value stocks cannot be called as value premium, rather it needs to be labelled as value anomaly.

This study also contributes to the methodological aspects in two ways in terms of calculating the parameter values and conducting the analysis. As far as the former is concerned, inclined by conservatism in estimating the return, and liberalism in estimating the risk, this study brings out new perspectives to (i) considering average returns based on daily returns, (ii) calculating holding period returns using geometric average, and (iii) approaching the risk 'as it plays out', rather than inferring it from the return. As far as the conduct of analysis is concerned, it successfully deploys Discriminant Analysis and shows that the results based on it can be more conclusive. We would like to note here that the Discriminant Analysis can be used for (i) supporting the classifications developed on a-priori basis, and (ii) building a discriminant function that can help in assigning individual observations to a particular class. As can be seen in this work, we have used it as a scientific test for supporting three pairs of portfolios that we created based on the Price-to-Book value ratio. Obviously, the prediction of class membership is not our objective; hence, we do not build the Z-score model.

Our findings are in agreement with the findings of many studies conducted particularly in developed countries. Thus, emerging markets in general, and India, in particular, are no exception to the globally observed value anomaly phenomenon. However, our result is not in agreement with Yen et al., (2004) who found mean reversion behaviour in returns after two years. In our case, the excess returns on value stock portfolio sustain over the entire period of study, i.e. sixteen years. Further, we find that the value anomaly is independent of the state of the economy. This finding is similar to Athanassakos (2009) who also documented that the excess return on value stocks was consistently found even during different economic states like recessions and recoveries.

Our findings of excess returns on value stocks sustaining over a long period of time has two implications. One on the practitioners like individual investors and mutual funds,

and the other on the academicians. The value anomaly can be exploited by the practitioners to their advantage. But at the same time, to the theorists it poses a challenge of reconciling the risks at an investor end with the set of risks being inferred from returns under the risk-based hypothesis.

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**Endnotes:**

1. A price multiple is a valuation ratio that shows the level of share price of a company in relation to some specific financial metric. The popular price multiples are (i) Price-to-Book ratio, (ii) Price-to-Earnings ratio, and (iii) Price-to-Cash flow ratio.

2. Value anomaly' stands for the excess return on stocks having low price multiples that cannot be explained with the observed risk associated with it; whereas the 'value premium' stands for extra risks over and above the observed risk. Since our findings do not support it to be labelled as a value premium, we prefer to address it as a value anomaly in this paper.

3. Sharpe ratio captures both return and risk in a single number. Against that, we want to identify and understand the specific effects of each of the two, separately. Additionally, our approach will be free from some limitations of Sharpe ratio as documented in the literature. For limitations, see Benson et al. (2008).

4. As far as the portfolio formation is concerned, we opt for using Price-to-Book value ratio as its basis, since it is theoretically a better discriminator between the value stocks and growth stocks. For example, see Anderson et al., (2003), Gonenc and Karan (2003), and Gharghori et al., (2013).Further elaboration on is available in the section on portfolio formation.