

Sharma, Mehak; Jain, Anshul

## Article

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\*Corresponding author: Mehak Sharma, Department of Financial Studies, University of Delhi - South Campus, India  
E-mail: [mehak1289@gmail.com](mailto:mehak1289@gmail.com)

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## FINANCIAL ECONOMICS | RESEARCH ARTICLE

# Role of size and risk effects in value anomaly: Evidence from the Indian stock market

Mehak Sharma<sup>1\*</sup> and Anshul Jain<sup>2</sup>

**Abstract:** Portfolios of companies with high book-to-market (BTM) ratio (low Price-To-Book (PB) ratios, Value firms) outperform those with companies with low BTM ratio (high PB ratios, Growth firms). In literature, this is known as the Value Anomaly. This anomaly is related to the third factor in the three-factor model of Fama and French, and is commonly used to explain the cross section of returns. Studies on the Value Anomaly in the Indian Stock Markets have yielded mixed results. Using a longer span of data and a larger set of companies, this study explores and observes the Value Anomaly in the Indian Stock Market. The contribution of size and systematic risk towards the behaviour of the Value Anomaly is studied. We observe that Value Anomaly exists in India, but with growth portfolios outperforming value. A critical analysis reveals possible linkages to firm size.

**Subjects:** Asset Pricing; Information Efficiency

**Keywords:** value anomaly; growth stock; beta; size adjusted returns

**JEL Classification:** G12; G14

## 1. Introduction

The outperformance of a portfolio of stocks of out-of-favour companies, known as “value portfolios” (comprising “value companies”) vis-a-vis a portfolio of stocks of in-favour companies, known as “growth portfolios” (comprising “growth companies”), is called the Value Anomaly (Lakonishok et al., 1994). In literature, the value portfolios are formed with companies having high book to market (BTM) ratio (low Price-to-Book (PB) ratio) and growth portfolios are formed with companies having low BTM ratios (high PB ratio). It has been observed that value portfolios usually have higher returns than growth portfolios (Chan et al., 1991; Hou et al., 2015; Stattman, 1980).

The value anomaly is part of a group of anomalies explored in literature, which are evidence of shortcomings of the Efficient Market Hypothesis. Further work by Fama (1998), Chen and Yeh (2002), Wilson and Marashdeh (2007), and Dutta (2015), have established the failures of market efficiency which points to existence of various anomalies. Presence of these anomalies is indicative

## ABOUT THE AUTHORS

Mehak Sharma is a Ph.D. Scholar at the Department of Financial Studies, University of Delhi South Campus, New Delhi, India.

Anshul Jain is an Assistant Professor at Management Development Institute Gurgaon, Gurgaon, India.

## PUBLIC INTEREST STATEMENT

A majority of researchers view financial markets to be efficient. This view is contested by a significant minority. Markets have structural features called “Anomalies”, which go against the very tenet of the majoritarian view of efficient markets. Developing markets such as India, with limited analyst coverage, show different market features and anomalies. Exploration of anomalies in India adds to our knowledge of how markets are far from efficient.

of either market inefficiency or inadequacy of the traditional asset pricing models (Cutler et al., 1989; Shiller, 1989; Laffont & Maskin, 1990; Shiller, 2000). Studies confirming the existence of the value anomaly goes back five decades (Basu, 1977). Of all the existing anomalies, the value anomaly has been regarded as one of the most consistent and profitable anomaly of the last half century (Arnott et al., 2020).

The shift of the Indian economy from a central planning, heavy regulation and closed economic model, to a more market-oriented, lightly regulated, open economic model has left its imprint on the growth trajectory of the firms listed on its exchanges. Thus, the Indian stock market presents a unique opportunity to study the stock market of a growing economy undergoing deregulation. Research has also shown that investor behaviour from developing markets may not follow the same path taken by investors from developed markets in regards to changing market conditions (Akhter & Yong, 2019). Globally, Indian stock markets rank 9<sup>th</sup> in terms of market capitalisation.<sup>1</sup> Prior studies on the value anomaly in the Indian stock market have yielded conflicting results. There are studies which support (Agarwalla et al., 2014) and claim absence (Paul & Karmakar, 2015) of value anomaly in India. There are studies that observe success of the three factor model (Fama & French, 1992) in explaining the cross section of returns (Bahl, 2006; Connor & Sehgal, 2001), significant value factor returns but insignificant and negative size factor returns (Agarwalla et al., 2014) and, there are studies that find no evidence of value strategies being successful in the Indian markets (Harshita & Yadav, 2018; Paul & Karmakar, 2015). Thus, the existing set of studies present conflicting results, due to various methodological and data related issues.

These studies in the Indian context have used small data spans and collected data for a small number of companies which makes them vulnerable to various sampling biases (Dash et al., 2018; Sharma et al., 2019). The portfolio-holding period also varies, with Harshita and Yadav (2018) utilising monthly returns, Paul and Karmakar (2015) utilising quarterly returns, whereas others use a holding period of a year to estimate annual returns.

This study aims to mitigate these issues and ensure robustness of the results. We utilise a dataset with a large data span of eleven years and include over 1,500 firms, which is a much larger number (five times) of firms compared to previous literature. The large dataset spans a range of market regimes and reduces sampling bias. Indian markets exhibit a tendency for continuation of patterns or momentum over a shorter period of time (Dhankar & Maheshwari, 2014). Hence, we explore the value anomaly utilising holding periods of one year.

Using this unique dataset we explore the value anomaly in the Indian stock market and aim to set to rest the debate regarding the presence or absence of the value anomaly in the Indian stock market. This is the first unique contribution of this study to literature. This study also explores the value anomaly over using both raw and size-adjusted returns, which is the second unique contribution of this study. The linkages between firm market capitalization, its systematic risk (equity beta), and the return differential caused due to the value anomaly is also explored.

The following section presents a review of literature. Data and methodology used are discussed thereafter, followed by a discussion of results. The paper concludes with comparing the results with literature and indicating a path to future research.

## 2. Literature review

Even before the spike of interest in investment strategies that fall outside the purview of Efficient Market Hypothesis (EMH), there were studies that found evidence of excess return or market inefficiencies (De Bondt & Thaler, 1985). The anomalies literature got its due attention post the October 1987 stock market crash. An avalanche of studies in late 1980s showcased the correlations between portfolios formed to explore anomalies. Fama and French (1988) found large negative autocorrelations for portfolios held beyond the time horizon of year for 1926–1985 period. Poterba and Summers (1988) showed positive autocorrelation over short

periods and negative autocorrelation over longer horizons of returns of individual firms over the 1926–1985 period. 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 behaviour of expected returns, respectively.

By the 1990s, the work on anomalies had established itself as a serious stream of research. The research on the size anomaly (Banz, 1981), the turn of the year anomaly (Keim, 1983; Roll, 1983), the momentum anomaly (Fama & French, 1996; Jegadeesh & Titman, 1993) and the value anomaly (Basu, 1977, 1983; Lakonishok et al., 1994), all contributed to this steadily growing literature indicating their persistence and the insight they provide into the investor behaviour.

The anomaly under investigation in this paper is the value anomaly, first researched upon in the late 1970s (Basu, 1977). Eventually, it was the work done by Statman (1980), that concluded a significant value anomaly based on price to book ratio in the US market, that truly brought attention to the book to market price (BTM) variable. Subsequent works by Chan et al. (1991) for Japanese stock markets and Fama & French (Fama & French, 1992) for US markets, found the BTM variable to have the best discriminatory power for value and growth stocks and that BTM, along with size of the firm, subsumes the explanatory powers of the earnings to price variable.

Decades later, the research in the topic is still ongoing with varying results. Work by Golubov and Konstantinidi (2019), done for the period of 1970–2013 for the common stocks listed on stock exchanges in the USA, argues that any value indicator is made of two parts—“market-to-value” and “value-to-book” and that it is the former that drives all the value return. The results attributed to expectational errors and limits to arbitrage are due to the “market-to-value” component. The “value-to-book” component that links the results between operating leverage, duration, analysts’ risk rating etc, offers no return predictability (Golubov & Konstantinidi, 2019). Almost parallel research done for years 1982–2015 that concludes that it is actually the earnings quality, that is in fact influential over both behavioural biases and risks associated with the stocks, that affect the size and insistence of value premium (Athanasakou & Athanassakos, 2019). There is also evidence of contingency of value premium on the industry and size of the stocks in the portfolios, with significant association between value stocks premium and small-cap stocks (Scislaw, 2015).

The research in developing markets especially, has made it abundantly clear that the value anomaly has idiosyncrasies contingent on the country it is being studied in. Research from Brazilian markets indicates a decidedly superior performance of growth portfolios in terms of profitability and dividend growth during the years 1997–2017 (De Vasconcelos & Martins, 2019). Yet, across similar duration of 1993–2017, the Nordic equity market observed an excess return by value portfolios, but only if small stocks were a part of the portfolios (Grobys & Huhta-Halkola, 2019). Studies in European markets observe that the value premium dilutes when a higher percentage of companies across the cross section form the value portfolio across the crisis periods. The study has concluded that, proportionally, the existence of a higher value premium decreases when the top 30% of the companies form the value portfolio when compared to 20% across the pre and post crisis periods. The difference, however, is absent when the comparison is between top 20 and 10% of the companies for value portfolios. (Liao et al., 2019)

Results from Asian economies are a mixed bag. Recent results from China find support for risk compensation in lieu of bearing the financial inflexibility of value companies (Clark & Qiao, 2020). Research from Pakistan, a developing economy that already has evidence supporting market inefficiencies (S. H. Rashid et al., 2018) finds evidence of significant influence of sentiment and momentum factors on size and value factors (A. Rashid et al., 2019).

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 of size etc. (Arnott et al., 2020) and still the source of this anomaly remains debated upon. Researchers have been divided between two major lines of

reasoning—Risk (arguably lead by the work done by Fama & French, 1992) and Mispricing (Lakonishok et al. (1994).

Linkage of the value anomaly to macroeconomic conditions has also gained credence. Guo et al. (2017) found evidence of co-movement between value premium and economic conditions of unemployment and inflation. Similar results have also been observed for developed nations (Atanasov & Nitschka, 2017). Atanasov and Nitschka (2017) using data from the USA found evidence of consistent value returns only in small stocks, and observed the association of value premium with business cycles and macro-economic changes. Gerakos and Linnainmaa (2018) posit that a factor based on the variation in size explains all of the value premium. This forms the main reason for not all high BTM firms earning the value premium (Gerakos & Linnainmaa, 2018). Although in the authors' opinion, this factor may just be a proxy for risk.

Studies exploring the value anomaly in the Indian market find evidence in support of the same (Anwar & Kumar, 2018, 2019; Bahl, 2006; Connor & Sehgal, 2001; Agarwalla et al., 2014; Dash et al., 2018), observe a negative premium for the value anomaly (Deb & Mishra, 2019) and absence of the value anomaly (Harshita & Yadav, 2018; Paul & Karmakar, 2015). These studies also highlight various idiosyncrasies of the value anomaly unique to the Indian market. Deb and Mishra (2019) observe that mid-market-capitalization portfolios show absence of value premium, low market capitalization portfolios show positive value premium and high market capitalization portfolios show negative value premium. Recent studies also claim erosion or at least reduction in the value premium (Harshita & Yadav, 2018; Sharma et al., 2019). Yet, almost simultaneous research show statistically significant value premium in Indian markets (Chhaya & Nigam, 2015). This conflict amongst studies begs to be resolved. Using a dataset spanning a decade and comprised of a large number of firms, we build multiple value-growth periods formed at different periods of time. This study delves into the nature of value anomaly in Indian stock markets and provides deep insights.

### 3. Data and methodology

Bombay Stock Exchange is the oldest stock exchange in India and has the largest number of listed companies. It was chosen for the purpose of data collection for this research. Of the 8,432 currently listed companies, many of which are restricted from trading, data for 1,543 companies is available on CMIE Prowess (corporate information database) for the past eleven years. These companies form the sample under study. For these companies, annual data comprising stock price, dividend, corporate actions, price to book multiple, beta and market capitalisation was collected for the period of 2009–2019. India follows an April–March financial year. The financial statements for listed companies of a financial year are released by June. Hence, for the purpose of the study, we are calculating July–June annual returns so that the information released in the market is completely captured. The first portfolio starts on 1 July 2009 and ends in 30 June 2010, thus capturing one year of returns. Similarly, in every July a one-year holding period portfolio is constructed. For purpose of our study, we calculate returns for portfolios of equi-weighted stocks. The return for every stock is estimated using the following formula -

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

Where,  $R_{t+1}$  is Return for the “t” to “t + 1” period and  $P_t$  and  $P_{t+1}$  are prices at time periods “t” and “t + 1”, respectively.

In literature, growth portfolios are formed by companies with low BTM ratios (high PB ratios), whereas companies with high BTM (low PB ratios) comprise value portfolios (Fama and French, 1992, 1993; Lakonishok et al., 1994) The companies were sorted on the PB multiple, for all the years under study. These were used to form annual deciles of companies for subsequent categorization between value and growth portfolios. The companies in the last decile (lowest PB) will be

referred to as the value portfolio and the companies in the first decile (highest PB) will be referred to as growth portfolio henceforth in the paper. The following table presents the annual average PB for the value and growth portfolios.

The difference in the PBs across the portfolios is visible in the ratio of growth portfolio average PB to the value portfolio average PB. It ranges from a low of 32 times (2009) to a high of 59 times (2010).

Literature supports the hypothesis that over a period of time value portfolios outperform growth portfolios. To test this, portfolio returns over an annual holding period were calculated for each of the value and growth portfolios.

The Students' t-test has been used widely in the value anomaly literature. Lakonishok et al. (1994), Conrad et al. (2003), Chen et al. (2008), Israel et al. (2020), Clark and Qiao (2020) and Ho and An (2020) use the t-test to test whether the difference in return between the value and growth portfolios is statistically significant. In studies pertaining to the Indian markets, the Students' t-test has been used by Agarwalla et al. (2014), Paul and Karmakar (2015), and Harshita and Yadav (2018).

The Students' t-test establishes if the difference between the means of two groups is statistically significant. For the purpose of this study, we use an adaptation of Student's t-test, known as the Welch's t-test. This adaptation does away with the assumption of homoscedasticity of the samples. Instead, it assumes that the samples might have different variances as they might come from different populations. This makes the Welch's t-test more robust than the commonly used Student's t-test. The Welch's t-test statistic is computed as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{N_1} + \frac{s_2^2}{N_2}}}$$

where,

$\bar{X}_1$  — is the mean of first sample with standard deviation  $s_1$  and sample size " $N_1$ "

$\bar{X}_2$  — is the mean of second sample with standard deviation " $s_2$ " and sample size " $N_2$ "

The Welch's t-test is used to test whether the returns from the value and growth portfolios differ from each other on a statistically significant basis. The value and growth portfolio returns were then controlled for the effect of size and the Welch's t-test was applied again to the size controlled returns. The corresponding p-values for the t-statistics have been estimated and reported in this study.

In studies pertaining to the Indian markets, the Students' t-test has been used by Agarwalla et al. (2014), Paul and Karmakar (2015), and Harshita and Yadav (2018). One of the objectives of this study is to use the larger dataset to consolidate the varying evidence regarding the value anomaly in India. Hence as the Students' t-test is commonly used and the Welch's t-test is a more robust version of the same, we use the Welch's t-test to ensure comparability with other existing literature.

#### 4. Results and discussion

A summary of the PB values for Growth and Value portfolios formed in different years is presented in Table 1. The Welch's t-test was applied on the raw returns (not controlled for size or risk) from the value and growth portfolio for each of the ten periods under study. Table 2 presents the details of this test. It is observed that the return differential between growth and value portfolios was statistically significant for all the ten years under consideration. The results indicate that value companies outperform growth firms in four years and underperform in six years.



**Table 1. Minimum, Mean & Maximum Values of PB for Growth & Value Portfolios**

Portfolio Formation Year	Growth Portfolio			Value Portfolio		
	Min	Mean	Max	Min	Mean	Max
2009	3.93	9.70	86.14	0.15	0.30	0.4
2010	4.93	24.86	328.36	0.16	0.42	0.56
2011	4.41	16.26	202.48	0.1	0.31	0.44
2012	3.49	10.14	142.42	0.06	0.22	0.33
2013	3.02	6.94	31.47	0.01	0.15	0.22
2014	5.06	10.41	40.09	0.05	0.26	0.38
2015	6.84	16.48	133.4	0.03	0.25	0.39
2016	6.21	14.36	108.83	0.05	0.28	0.41
2017	6.88	16.26	116.22	0.06	0.33	0.52
2018	6.08	14.83	184.76	0.05	0.27	0.42

**Table 2. Returns of Growth and Value portfolios**

Portfolio Formation Year	Growth Portfolio	Value Portfolio	p-value	Outperformer
2009	0.493	0.805	0.001***	Value
2010	0.193	-0.005	0.019**	Growth
2011	-0.040	-0.129	0.061*	Growth
2012	0.051	-0.153	0.000***	Growth
2013	0.485	1.068	0.000***	Value
2014	0.553	0.066	0.000***	Growth
2015	0.191	0.394	0.052*	Value
2016	0.222	0.348	0.097*	Value
2017	0.051	-0.044	0.087*	Growth
2018	-0.074	-0.217	0.054*	Growth

Note—“\*\*\*” indicates t-test is significant at 1%. “\*\*” indicates t-test is significant at 5%. “\*” indicates t-test is significant at 10%.

Literature indicates that value portfolios should outperform growth portfolios. Our mixed results are not supported by literature, which also highlights how different prior studies in India found evidence both for and against the value anomaly. This is a unique behaviour which deserves exploration.

In literature, the return differential has also been explored after controlling for the role of size of the firms in the portfolio (Fama & French, 1992; Lakonishok et al., 1994). The role of size as a factor for explanation of various anomaly return differentials is also widely explored in the literature. We re-estimate the portfolio returns controlling for the size of the companies in the portfolio. A strong correlation between the value premium and small-cap stocks has also observed in the literature (Scislaw, 2015).

To estimate the size-controlled returns, the companies were divided in deciles on the basis of their size (market capitalization). The mean return was calculated for each decile. The respective size decile mean return was deducted from a company's unadjusted raw return to arrive at its size-controlled return (Lakonishok et al., 1994). In our study, the top decile represents the firms with highest market capitalization and extreme bottom decile represents the firms with lowest market capitalization.

Table 3 presents the value and growth portfolio returns controlled for size, and p-value from the Welch's t-test performed on them. The cases of statistically significant return differential declined, down



**Table 3. Average size-controlled-returns of Growth and Value portfolios**

Portfolio Formation Year	Growth Portfolio	Value Portfolio	p-value	Outperformer
2009	-0.115	-0.084	0.757	
2010	0.178	-0.063	0.003***	Growth
2011	0.028	-0.039	0.151	
2012	0.064	-0.067	0.010**	Growth
2013	-0.203	0.506	0.000***	Value
2014	0.306	-0.271	0.000***	Growth
2015	0.012	-0.065	0.445	
2016	-0.110	-0.140	0.691	
2017	0.011	-0.084	0.083*	Growth
2018	0.003	-0.040	0.543	

Note—“\*\*\*” indicates t-test is significant at 1%. “\*\*” indicates t-test is significant at 5%. “\*” indicates t-test is significant at 10%.

to five out of ten years. This is the first indication that controlling for size has an effect on the extent of the value anomaly. Size and value anomalies are thus related in the Indian markets. The direction of the return differential is more consistent than for the raw returns. Value portfolios outperform growth portfolios in only one out of the five statistically significant years, whereas growth portfolios outperform value portfolios in the remaining four years. The direction of outperformance, though more consistent (growth outperforms value), does not find support in literature, prompting further enquiry.

A return differential between two portfolios can only be because of two reasons—*inherent riskiness of the companies and portfolios, or errors in expectations of investors regarding the future of the companies* (Lakonishok et al., 1994).

To examine if riskiness of the companies forming the portfolios was the reason for the return differential, the equity beta of the companies for all the years in both the portfolios was estimated to measure the portfolio beta (Lakonishok et al., 1994). Systematic risk of individual stocks measured by equity beta may be subject to errors, but on a portfolio level the noise in the data is reduced and the estimation of beta is more robust (Fama & MacBeth, 1973). It was observed that the betas for the value and growth portfolios are different at a statistically significant level for

**Table 4. Average beta for Growth and Value portfolios**

Portfolio Formation Year	Growth Portfolio	Value Portfolio	p-value	Higher Systematic Risk
2009	0.858	0.898	0.360	Value
2010	0.892	0.983	0.026**	Value
2011	0.843	1.047	0.000***	Value
2012	0.770	1.084	0.000***	Value
2013	0.753	1.175	0.000***	Value
2014	0.858	1.165	0.000***	Value
2015	0.881	1.210	0.000***	Value
2016	0.942	1.106	0.010**	Value
2017	1.016	1.038	0.747	Value
2018	1.017	1.145	0.061*	Value

Note—“\*\*\*” indicates t-test is significant at 1%. “\*\*” indicates t-test is significant at 5%. “\*” indicates t-test is significant at 10%.

eight out of ten years under study. The average beta for value portfolios was larger than the growth portfolios in ten out of ten years. Hence, the value portfolios are both underperforming and more risky than the growth portfolios. Table 4 presents the results.

It can be argued that systematic risk is hence not the cause of the return differential. For all ten periods, the beta of value portfolios is larger than that of growth portfolios, and for eight years the difference is statistically significant. Yet the value portfolio outperforms and underperforms the growth portfolio in different years, depending on whether raw returns or size-controlled returns are considered. This indicates that risk, as measured by beta, is not a factor in the unique behaviour of the value anomaly in India.

This result finds only partial support in literature. Value portfolios are expected to be riskier than growth portfolios (Fama & French, 1992, 1993; Petkova & Zhang, 2005), but that is also reflected in higher average returns, which is not the case in our study. This implies that risk was not responsible for the observed results, but rather errors in expectations may be a reason for our observed results.

The large number of years with a statistically significant return differential between value and growth portfolios points to the presence of inefficiencies in Indian markets.

This discrepancy, of growth portfolios outperforming values portfolios, may have arisen due to three reasons. The first is that the time period of only one year of buy and hold for the portfolios is too short for the market to correct its inefficiencies. This is in line with studies that conclude that developing economies like India do not have efficient markets and have less than optimal asset allocation (Gupta & Basu, 2007).

The second reason may be that the momentum anomaly in the market is so strong that growth portfolios tend to coast for longer on the positivity attributed to them by the market participants. Indian markets have the tendency to hold on continuation patterns for a short period of time (3–12 months) and only reverse or show abnormal profits for contrarian strategies in the long term of 36 months (Dhankar & Maheshwari, 2014).

The third reason may be absence of the size anomaly in India (Agarwalla et al., 2014) and the correlation between size and value we observe in our value and growth portfolios. Growth portfolios in Indian markets are majorly comprised of large firms i.e. the firms that fall in top three deciles made on the basis of market capitalization. The opposite is true for value portfolios, which are majorly

**Table 5. Percentage of large and small firms in Growth and Value portfolios**

Portfolio Formation Year	Percentage of Large firms in Growth portfolio	Percentage of Small firms in Value portfolio
2009	68%	70%
2010	70%	75%
2011	70%	75%
2012	73%	72%
2013	81%	68%
2014	75%	74%
2015	70%	68%
2016	68%	67%
2017	65%	69%
2018	70%	69%

Note—Firms in the top 3 decile of a descending sort on market capitalization are considered as large firms and the bottom 3 deciles are considered as small firms.

comprised of small firms, falling in the bottom three deciles of size. Approximately two-thirds of companies in all growth portfolios are large whereas, approximately two-thirds of companies in all value portfolios are small. Table 5 provides the details.

Even though we have considered returns controlled for size, it seems that some characteristics common to firms of large or small size are still driving the return differential between value and growth portfolios. The literature on Size Anomaly observes that small firm portfolios outperform large firm portfolios (Banz, 1981; Ho et al., 2020), and Value Anomaly literature observes that value portfolios outperform growth. Ideally, value portfolios comprising small firms should outperform growth portfolios comprising large firms. But a detailed study by Agarwalla et al. (2014) fails to support the size anomaly in Indian markets. Agarwalla et al. also indicate that small firms fail to become large in India, whereas large firms persist to remain large. This is a unique characteristic of the Indian markets and is the reason for the absence of size anomaly. As value and growth portfolios are biased towards small and large size portfolios (respectively), absence of the size anomaly does indicate that the value anomaly may not behave as it does in other markets. It remains open to exploration whether some common characteristic of large or small companies is causing growth portfolios to outperform value portfolios in India.

## 5. Conclusion

This study utilizes data from 1,543 listed firms on the Bombay Stock Exchange over a period of 11 years to explore the behaviour of the value anomaly in the Indian stock market, and the effect of size and risk on it. The results indicate that value companies underperform vis-à-vis the growth companies and that return differential was statistically significant, for both raw portfolio returns and portfolio returns controlled for size. Value portfolios were also observed to have higher beta than their growth counterparts and the beta differential is also statistically significant for eight out of the ten-year period under study. It was also observed that almost two thirds of firms in value portfolios and growth portfolios were small and large respectively.

This underperformance of value companies with respect to growth companies is contrary to the literature from developed markets (Atilgan et al., 2020). However, Indian markets have evidence of weak form inefficiency and sub-optimal asset allocation (Gupta and Basu, 2007; Gupta and Yang, 2011) that could cause this difference. The value portfolios in general have also seen relative underperformance in the last 12 years and that has been attributed to growth portfolios getting more expensive (Arnott, Harvey, Kalesnik, & Linnainmaa, 2020). This explanation also plays into the growth portfolios enjoying the prevalent greater degree of momentum in the Indian Market especially in the shorter time frame of 3–12 months (Dhankar & Maheshwari, 2014). The linkage between value-small portfolios and growth-large portfolios, coupled with the absence of the size anomaly in India (Agarwalla et al., 2014), indicates that further research is required to explore this linkage.

This study also observes the breakdown of relationship between systematic risk and returns. Given that the beta is consistently higher for value portfolios in comparison to the growth portfolios, the underperformance of value portfolios points towards breakdown of relationship between systematic risk and returns as posited by CAPM. Similar results have been observed for Turkish markets where no systematic unconditional relationship between portfolio excess returns and beta have been found (Terregrossa & Eraslan, 2016).

The results observed can be argued to be a specific characteristic trait of the Indian Markets where positive relation between size and returns can influence the Value Anomaly enough to result in a return differential that is not supported by the existing literature. This along with the absence of the size anomaly in the Indian market (Agarwalla et al., 2014), makes this market unique and worthy of further study.

Further research is required on whether increasing the holding period of the portfolios changes the outcomes of the results. Interaction with Momentum Anomaly and herding behaviour of investors can be explored. A cross country study across other developing markets should also be conducted to explore whether the Value Anomaly holds in those markets or whether they too have growth portfolios outperforming value portfolios.

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#### Author details

Mehak Sharma<sup>1</sup>

E-mail: [mehak1289@gmail.com](mailto:mehak1289@gmail.com)

Anshul Jain<sup>2</sup>

E-mail: [anshul@mdi.ac.in](mailto:anshul@mdi.ac.in)

ORCID ID: <http://orcid.org/0000-0002-4007-5512>

<sup>1</sup> University of Delhi South Campus, New Delhi, India.

<sup>2</sup> Management Development Institute Gurgaon, Gurgaon, India.

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#### Note

1. World Federation of Exchanges, Annual Statistics Guide 2019

#### References

- Agarwalla, S. K., Jacob, J., & Varma, J. R. (2014). Four factor model in Indian equities market. *Indian Institute of Management Ahmedabad, Working Paper*, (2013-09), 05.
- Akhter, T., & Yong, O. (2019). Adaptive market hypothesis and momentum effect: Evidence from Dhaka stock exchange. *Cogent Economics & Finance*, 7(1), 1650441. <https://doi.org/10.1080/23322039.2019.1650441>
- Anwar, M., & Kumar, S. (2018). Three-factor model of asset pricing: Empirical evidence from the Indian stock market. *IUP Journal of Applied Finance*, 24(3), 16-34. [https://www.iupindia.in/1807/Applied%20Finance/Three\\_Factor\\_Model\\_of\\_Asset\\_Pricing.asp](https://www.iupindia.in/1807/Applied%20Finance/Three_Factor_Model_of_Asset_Pricing.asp)
- Anwar, M., & Kumar, S. (2019). Vigorousness of Asset Pricing Models: Evidence from the Stock Market in India. *IUP Journal of Management Research*, 18(3), 7-24. [https://www.iupindia.in/1907/Management%20Research/Vigorousness\\_of\\_Asset.asp](https://www.iupindia.in/1907/Management%20Research/Vigorousness_of_Asset.asp)
- Arnott, R. D., Harvey, C. R., Kalesnik, V., & Linnainmaa, J. T. (2020). Reports of Value's Death May Be Greatly Exaggerated. SSRN. <https://ssrn.com/abstract=3488748>
- Atanasov, V., & Nitschka, T. (2017). Firm size, economic risks, and the cross-section of international stock returns. *The North American Journal of Economics and Finance*, 39, 110-126. <https://doi.org/10.1016/j.najef.2016.12.004>
- Athanasakou, V. E., & Athanassakos, G. (2019). Earnings quality and book-to-market in the cross section of expected returns. SSRN 3467747.
- Atilgan, Y., Demirtas, K. O., Gunaydin, A. D., & Kirli, I. (2020). Decomposing value globally. *Applied Economics*, 52(42), 1-18. <https://doi.org/10.1080/00036846.2020.1739614>
- Bahl, B. (2006). Testing the Fama and French three-factor model and its variants for the Indian stock returns. SSRN 950899.
- Banz, R. W. (1981). The relationship between return and market value of common stocks. *Journal of Financial Economics*, 9(1), 3-18. [https://doi.org/10.1016/0304-405X\(81\)90018-0](https://doi.org/10.1016/0304-405X(81)90018-0)
- Basu, S. (1977). Investment performance of common stocks in relation to their price-earnings ratios: A test of the efficient market hypothesis. *The Journal of Finance*, 32(3), 663-682. <https://doi.org/10.1111/j.1540-6261.1977.tb01979.x>
- Basu, S. (1983). The relationship between earnings' yield, market value and return for NYSE common stocks: Further evidence. *Journal of Financial Economics*, 12(1), 129-156. [https://doi.org/10.1016/0304-405X\(83\)90031-4](https://doi.org/10.1016/0304-405X(83)90031-4)
- Chan, L. K., Hamao, Y., & Lakonishok, J. (1991). Fundamentals and stock returns in Japan. *The Journal of Finance*, 46(5), 1739-1764. <https://doi.org/10.1111/j.1540-6261.1991.tb04642.x>
- Chen, L., Petkova, R., & Zhang, L. (2008). The expected value premium. *Journal of Financial Economics*, 87(2), 269-280. <https://doi.org/10.1016/j.jfineco.2007.04.001>
- Chen, S. H., & Yeh, C. H. (2002). On the emergent properties of artificial stock markets: The efficient market hypothesis and the rational expectations hypothesis. *Journal of Economic Behavior & Organization*, 49(2), 217-239. [https://doi.org/10.1016/S0167-2681\(02\)00068-9](https://doi.org/10.1016/S0167-2681(02)00068-9)
- Chhaya, G., & Nigam, P. (2015). Value investing with price-earnings ratio in India. *IUP Journal of Applied Finance*, 21(2), 34. [https://www.iupindia.in/1504/Applied%20Finance/Applied\\_Finance.asp?mag=http://www.iupindia.in/1504/Applied%20Finance/Applied\\_Finance\\_sub.asp](https://www.iupindia.in/1504/Applied%20Finance/Applied_Finance.asp?mag=http://www.iupindia.in/1504/Applied%20Finance/Applied_Finance_sub.asp)
- Clark, E., & Qiao, Z. (2020). The value premium puzzle, behavior versus risk: New evidence from China. *The Quarterly Review of Economics and Finance*, 76, 12-21. <https://doi.org/10.1016/j.qref.2019.04.007>
- Connor, G., & Sehgal, S. (2001). Tests of the Fama and French model in India. Discussion Paper 379, Financial Markets Group, London School of Economics.
- Conrad, J., Cooper, M., & Kaul, G. (2003). Value versus glamour. *The Journal of Finance*, 58(5), 1969-1995. <https://doi.org/10.1111/1540-6261.00594>
- Conrad, J., & Kaul, G. (1988). Time-variation in expected returns. *The Journal of Business*, 61(4), 409-425. <https://doi.org/10.1086/296441>
- Cutler, D. M., Poterba, J. M., & Summers, L. H. (1989). What moves stock prices? T. *The Journal of Portfolio Management*, 15(3), 3. <https://doi.org/10.3905/jpm.1989.409212>
- Dash, M., Kantheti, S., & Teja, G. K. (2018). The book-to-market anomaly for banking stocks in the Indian stock market: A panel regression analysis. *Journal of Applied Management and Investments*, 7(1), 15-23. <http://jami.org.ua/abstracts7-1-2.htm>
- De Bondt, W. F., & Thaler, R. (1985). Does the stock market overreact? *The Journal of Finance*, 40(3), 793-805. <https://doi.org/10.1111/j.1540-6261.1985.tb05004.x>
- de Vasconcelos, L. N. C., & Martins, O. S. (2019). Value and growth stocks and shareholder value creation in Brazil. *Revista De Gestão*, 26(3), 293-312. <https://doi.org/10.1108/REG-12-2018-0127>
- Deb, S. G., & Mishra, B. (2019). A new insight into value premium and size premium. *IIMB Management Review*, 31(4), 324-335. <https://doi.org/10.1016/j.iimb.2019.07.004>

- Dhankar, R., & Maheshwari, S. (2014). A study of contrarian and momentum profits in Indian stock market. *International Journal of Financial Management*, 4(2), 40–54. <http://www.i-scholar.in/index.php/ijfm/article/view/59986>
- Dutta, A. (2015). Improved calendar time approach for measuring long-run anomalies. *Cogent Economics & Finance*, 3(1), 1065948. <https://doi.org/10.1080/23322039.2015.1065948>
- Eugene, F., & Kenneth, F. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33(1), 3–56. [https://doi.org/10.1016/0304-405X\(93\)90023-5](https://doi.org/10.1016/0304-405X(93)90023-5)
- Fama, E. F. (1998). Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics*, 49(3), 283–306. [https://doi.org/10.1016/S0304-405X\(98\)00026-9](https://doi.org/10.1016/S0304-405X(98)00026-9)
- Fama, E. F., & French, K. R. (1988). Permanent and temporary components of stock prices. *Journal of Political Economy*, 96(2), 246–273. <https://doi.org/10.1086/261535>
- Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance*, 47(2), 427–465. <https://doi.org/10.1111/j.1540-6261.1992.tb04398.x>
- Fama, E. F., & French, K. R. (1996). Multifactor explanations of asset pricing anomalies. *The Journal of Finance*, 51(1), 55–84. <https://doi.org/10.1111/j.1540-6261.1996.tb05202.x>
- Fama, E. F., & MacBeth, J. D. (1973). Risk, return, and equilibrium: Empirical tests. *Journal of Political Economy*, 81(3), 607–636. <https://doi.org/10.1086/260061>
- Gerakos, J., & Linnainmaa, J. T. (2018). Decomposing value. *The Review of Financial Studies*, 31(5), 1825–1854. <https://doi.org/10.1093/rfs/hhx118>
- Golubov, A., & Konstantinidi, T. (2019). Where is the risk in value? Evidence from a market-to-book decomposition. *The Journal of Finance*, 74(6), 3135–3186. <https://doi.org/10.1111/jofi.12836>
- Grobys, K., & Huhta-Halkola, T. (2019). Combining value and momentum: Evidence from the Nordic equity market. *Applied Economics*, 51(26), 2872–2884. <https://doi.org/10.1080/00036846.2018.1558364>
- Guo, H., Wu, C., & Yu, Y. (2017). Time-varying beta and the value premium. *Journal of Financial and Quantitative Analysis*, 52(4), 1551–1576. <https://doi.org/10.1017/S0022109017000382>
- Gupta, R., & Basu, P. K. (2007). Weak form efficiency in Indian stock markets. *International Business & Economics Research Journal (IBER)*, 6(3), 57–64. <https://doi.org/10.19030/iber.v6i3.3353>
- Gupta, R., & Yang, J. (2011). Testing weak form efficiency in the Indian capital market. *International Research Journal of Finance and Economics*, 75(1), 108–119. [http://www.internationalresearchjournaloffinanceand-economics.com/ISSUES/IRJFE\\_Issue\\_75.htm](http://www.internationalresearchjournaloffinanceand-economics.com/ISSUES/IRJFE_Issue_75.htm)
- Harshita, S., & Yadav, S. S. (2018). Changing Nature of the Value Premium in the Indian Stock Market. *Vision*, 22(2), 135–143. <https://doi.org/10.1177/0972262918766135>
- Ho, K.-Y., & An, J. (2020). Decomposing the value premium: The role of intangible information in the Chinese stock market. *Emerging Markets Review*, 44, 100700. <https://doi.org/10.1016/j.ememar.2020.100700>
- Ho, K. Y., An, J., & Zhang, Z. (2020). Size matters after all: Evidence from the Chinese stock market. *China's Rise And Internationalization: Regional And Global Challenges And Impacts*, 9, 237–249. [https://doi.org/10.1142/9789811212239\\_0009](https://doi.org/10.1142/9789811212239_0009)
- Hou, K., Xue, C., & Zhang, L. (2015). Digesting anomalies: An investment approach. *The Review of Financial Studies*, 28(3), 650–705. <https://doi.org/10.1093/rfs/hhu068>
- Israel, R., Laursen, K., & Richardson, S. A. (2020). Is (systematic) value investing dead? SSRN.
- Jegadeesh, N., & Titman, S. (1993). Returns to buying winners and selling losers: Implications for stock market efficiency. *The Journal of Finance*, 48(1), 65–91. <https://doi.org/10.1111/j.1540-6261.1993.tb04702.x>
- Keim, D. B. (1983). Size-related anomalies and stock return seasonality: Further empirical evidence. *Journal of Financial Economics*, 12(1), 13–32. [https://doi.org/10.1016/0304-405X\(83\)90025-9](https://doi.org/10.1016/0304-405X(83)90025-9)
- Laffont, J. J., & Maskin, E. S. (1990). The efficient market hypothesis and insider trading on the stock market. *Journal of Political Economy*, 98(1), 70–93. <https://doi.org/10.1086/261669>
- Lakonishok, J., Shleifer, A., & Vishny, R. W. (1994). Contrarian investment, extrapolation, and risk. *The Journal of Finance*, 49(5), 1541–1578. <https://doi.org/10.1111/j.1540-6261.1994.tb04772.x>
- Liao, T. L., Tsai, L. C., Ke, M. C., Chiang, Y. C., & Hsu, C. H. (2019). Financial crisis and market efficiency: Evidence from European stock markets. *The European Journal of Finance*, 25(13), 1194–1210. <https://doi.org/10.1080/1351847X.2019.1584579>
- Lo, A. W., & MacKinlay, A. C. (1988). Stock market prices do not follow random walks: Evidence from a simple specification test. *The Review of Financial Studies*, 1(1), 41–66. <https://doi.org/10.1093/rfs/1.1.41>
- Paul, S., & Karmakar, M. (2015). Does value premium exist in India? *IUP Journal of Applied Economics*, 14(2), 54. [https://www.iupindia.in/1504/Applied%20Economics/Applied\\_Economics.asp?mag=http://www.iupindia.in/1504/Applied%20Economics/Applied\\_Economics\\_sub.asp](https://www.iupindia.in/1504/Applied%20Economics/Applied_Economics.asp?mag=http://www.iupindia.in/1504/Applied%20Economics/Applied_Economics_sub.asp)
- Petkova, R., & Zhang, L. (2005). Is value riskier than growth? *Journal of Financial Economics*, 78(1), 187–202. <https://doi.org/10.1016/j.jfineco.2004.12.001>
- Poterba, J. M., & Summers, L. H. (1988). Mean reversion in stock prices: Evidence and implications. *Journal of Financial Economics*, 22(1), 27–59. [https://doi.org/10.1016/0304-405X\(88\)90021-9](https://doi.org/10.1016/0304-405X(88)90021-9)
- Rashid, A., Fayyaz, M., & Karim, M. (2019). Investor sentiment, momentum, and stock returns: An examination for direct and indirect effects. *Economic research-Ekonomska Istraživanja*, 32(1), 2638–2656. <https://doi.org/10.1080/1331677X.2019.1650652>
- Rashid, S. H., Sadaqat, M., Jebran, K., & Memon, Z. A. (2018). Size premium, value premium and market timing: Evidence from an emerging economy. *Journal of Economics, Finance and Administrative Science*, 23(46), 266–288. <https://doi.org/10.1108/JEFAS-09-2017-0090>
- Roll, R. (1983). On computing mean returns and the small firm premium. *Journal of Financial Economics*, 12(3), 371–386. [https://doi.org/10.1016/0304-405X\(83\)90055-7](https://doi.org/10.1016/0304-405X(83)90055-7)
- Scislaw, K. E. (2015). The value premium within and across GICS industry sectors in a pre-financial collapse sample. *Cogent Economics & Finance*, 3(1), 1045214. <https://doi.org/10.1080/23322039.2015.1045214>
- Sharma, G., Subramaniam, S., & Sehgal, S. (2019). Are prominent equity market anomalies in India fading away? *Global Business Review*, 1–16. <https://doi.org/10.1177/0972150918811248>

- Shiller, R. J. (1989). Comovements in stock prices and comovements in dividends. *The Journal of Finance*, 44(3), 719–729. <https://doi.org/10.1111/j.1540-6261.1989.tb04387.x>
- Shiller, R. J. (2000). Measuring bubble expectations and investor confidence. *The Journal of Psychology and Financial Markets*, 1(1), 49–60. [https://doi.org/10.1207/S15327760JPFM0101\\_05](https://doi.org/10.1207/S15327760JPFM0101_05)
- Stattman, D. (1980). Book values and stock returns. *The Chicago MBA: A Journal of Selected Papers*, 4(1), 25–45. [https://scholar.google.com/scholar?](https://scholar.google.com/scholar?cluster=360982993174268450&hl=en&as_sdt=2005&sciodt=0,5)
- Terregrossa, S. J., & Eraslan, V. (2016). An analysis of the relation between return and beta for portfolios of Turkish equities. *Cogent Economics & Finance*, 4(1), 1168501. <https://doi.org/10.1080/23322039.2016.1168501>
- Wilson, E. J., & Marashdeh, H. A. (2007). Are co-integrated stock prices consistent with the efficient market hypothesis? *Economic Record*, 83(s1), S87–S93. <https://doi.org/10.1111/j.1475-4932.2007.00409.x>



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