



The Value-Growth Indicators and Value Premium: Evidence from Pakistan Stock Exchange

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Abstract: *This paper aims to study the ability of the six value-growth indicators (i.e. gross profit to total assets, earning to price, book to market, dividend to price, cashflow to price and sales to price ratio) to generate value premium in Pakistan Stock Exchange. This paper uses the methodology of Dimson, Nagel, and Quigley (2003) to construct Fama and French factors. Using the data of daily stock returns from year 2001 to 2014 to form value weighted two dimensional portfolios, this study reports the existence of strong value premium for Pakistan equity market. Value premium is positive irrespective of the value-growth indicator used. Book to market ratio, although widely used in previous studies, generates lowest value premium (along with sales to price ratio). Additionally, gross profit to total assets when used as value-growth indicator can explain more variations in stock returns whereas, dividend to price ratio have lowest explanatory power of all the proxies used in this study.*

Keywords: Value premium, value-growth effect, book to market effect.

Introduction

Conducting a research on the performance of style based trading strategies is important for portfolio managers and it had attracted considerable attention for last few decades. There are different categories of stocks whose prices move very differently e.g. small and big stocks, value and growth stocks, winner and loser stocks etc., and there may be an opportunity for active portfolio management by investing in category of stock that outperform its counterpart. The vantage of such an investment opportunity lies in the investor's ability to define classes. Should stocks be classified by their industry, their size, age, certain financial ratios, or some other measure's There is no consensus among the analysts and investors regarding the investment style that provides the highest return. According to the study of Bourguignon and Marielle (2003), investment in value or growth stocks is one of the popular investment style in the financial market. The discovery of value style can be linked to the beginning of 20th century. Investors in the early 20th century believed that the necessary element for a stock to be categorized as good stock is its increasing trend in earnings (Graham & Dodd, 1935). However, after the Great Depression of 1929-39, people started to doubt not only the investment theory that advocates investment in stocks

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with increasing trend in earnings but also investment in stock market in general. [Graham and Dodd \(1935\)](#) reestablished investors' confidence in the stock market by introducing a paradigm shift in the investment. They advocated the idea of investing in stocks with prices below its fundamental value (categorized as value stocks) to leave investors with sufficient margin of safety.

While Graham and Dodd offered a framework to identify value stock, since 1930s, there had been no universal agreement among industry practitioners on the definition of value and growth stocks ([Tbbotson & Riepe, 1997](#)). Academic studies tend to simplify the definition of value stocks down to stock of firms with a high ratio of fundamentals to price such as the Book-to-Market ratio, earnings, cash flow or dividend yield¹. High ratio of fundamentals to stock prices firms are often perceived as priced relatively cheaper compared with their "intrinsic value" or other comparable firms with a lower corresponding ratio. This lower market price compared to the firm's fundamentals is due to the past poor performance that the investor expects would continue in future. It may be a signal that the company reached its maturity and may not have growth opportunities in future ([Graham & Dodd, 1935](#)). On the other hand, firms with low fundamental value as compared to the market prices are characterized as growth stocks. These stocks have high earning and growth expectations and investors expect that their growth would continue in future by investor ([Babson, 1951](#); [Bourguignon & Marielle, 2003](#); [La Porta, Lakonishok, Shleifer, & Vishny, 1997](#); [Leledakis & Davidson, 2001](#)). The higher average return of value firms as compared to growth firms is referred to as value premium ([Bauman & Dowen, 1988](#); [Bauman & Miller, 1997](#); [Capaul, Rowley, & Sharpe, 1993](#); [Chahine, 2008](#); [Yen, Sun, & Yan, 2004](#)). For instance, it is probable that an investor gives preference to value stocks in case of value premium because of its higher returns when compared with its counterpart ([Bird & Casavecchia, 2007b](#)). Moreover, an investor is likely to be indifferent on the purchase of value or growth stock, if value premium is zero ([Bourguignon & Marielle, 2003](#); [Capaul et al., 1993](#)).

The study of [Rosenberg, Reid, and Lanstein \(1985\)](#) was the first evidence of value premium using book to market ratio. Additionally, there are different value-growth indicators identified in literature such as, gross profit to total asset ([Novy, 2013](#)), cash flow to price ([K. Chan & Chen, 1991](#); [Lakonishok et al., 1994](#)), sales to price ([J. Barbee, William, Mukherji, & Raines, 1996](#)), dividend to price ([Blume, 1980](#); [Litzenberger & Ramaswamy, 1982](#); [Rozeff, 1984](#)) and earning to price ([Basu, 1983](#); [Jaffe, Keim, & Westerfield, 1989](#); [Rozeff, 1984](#)). Keeping in view the above discussion, it is important to examine the ability of different value growth indicators that disentangle stocks into its value and growth components. Therefore, this paper intends to identify value premium in Pakistan equity market and to evaluate the performance of gross profit to total assets, book to market, earning, dividend, cashflow and sales to price ratio in generating stock returns of Pakistani Capital Market. Using the data of 250 firms from 2000 to 2007. The study of [Hassan and Javed \(2011\)](#) identified a positive value premium for Pakistan equity market by using book to market ratio. Additionally, using the data of 81 firms from 2003 to 2007, the study of [Mirza and Shahid \(2008\)](#) reported a negative value premium for Pakistan stock market,

¹[Athanasakos \(2011\)](#); [Bourguignon and Marielle \(2003\)](#); [Chahine \(2008\)](#); [L. K. Chan and Lakonishok \(2004\)](#); [Lakonishok, Shleifer, and Vishny \(1994\)](#); [Leledakis and Davidson \(2001\)](#).

also using book to market ratio as value-growth indicator. The study findings are useful for institutional investors and money managers of Pakistani Capital Market to earn higher return on their investment.

From here onwards the paper is divided into following sections. Section 2 presents the critical review of the existing literature on value premium and the value-growth indicators. Section 3 elaborates the sampling technique, sample size, portfolio formation and return estimation methodology. Section 4 discusses the results and finally, section 5 presents the conclusion and research implications.

Literature Review

There is extensive empirical evidence on the existence of value premium. Research on the profitability of the value-growth trading strategy, i.e. the investment strategy that supports the investment in value stocks as opposed to growth stocks, started in the U.S. market (Basu, 1977; Fama & French, 1992; Lakonishok et al., 1994; Litzemberger & Ramaswamy, 1979; Rosenberg et al., 1985). Using the data from 1971 to 1988, K. Chan and Chen (1991) reported value premium for Japanese market. Extending the investigation, (Fama & French, 1998) estimated a positive value premium for thirteen developed and emerging markets over the period of 1975 to 1995. Similarly, Capaul et al. (1993) documented a positive value premium in six developed markets including Japan over a period from 1981 to 1992. Even after taking into account the different time periods of buy and hold strategy and the transaction cost of performing these strategies, book to market ratio still is a significant factor in explaining stock returns (Dennis, Perfect, Snow, & Wiles, 1995).

According to the study of Loughran (1997), in the UK stock market small firms earn more value premium than big stocks. There is extensive international evidence on the higher performance of value stocks (W. Barbee, Jeong, & Mukherji, 2008; Bird & Whitaker, 2003; Brown, Du, Rhee, & Zhang, 2008; L. K. Chan & Lakonishok, 2004; Dimson et al., 2003; Fama & French, 2006). Whereas the study of Chung, Hsu, Ke, Liao, and Chiang (2016) suggests that value premium is weakening in Australian and New Zealand market over the recent period. Using the monthly closing prices from June 2000 to June 2007 for more than 250 non-financial stocks listed at Karachi Stock Exchange, Hassan and Javed (2011) reported a positive value premium.

The existence of value premium may seem a simple phenomenon; however, there exist different interpretations and arguments regarding its existence. There are two common explanations for the existence of value premium, one group of researcher supports a risk based hypothesis, whereas the second group support behavioral hypothesis. The research of DeBondt, Werner, and Richard (1985, 1987) supports the view that value premium exists because of behavioral reasons. They explain that investor's inclination to overreaction causes the departure of stock prices from their fundamental value. The expectation error or extrapolation hypothesis about future earnings performance (La Porta, 1996; La Porta et al., 1997; Lakonishok et al., 1994) and limit to arbitrage hypothesis (Shleifer & Vishny, 1997) supports the behavioral explanation of value premium. In addition to the extrapolation and limit to arbitrage hypothesis, value premium has also been attributed to idiosyn-

cratic return volatility, higher transaction cost of (Ali, Hwang, & Trombley, 2003), earning surprise (Dreman & Berry, 1995) and investor's sophistication (Lakonishok et al., 1994).

The second group of researchers holds risk factors responsible for the existence of value premium. According to Berk, Green, and Naik (1999), book to market ratio of a firm can be used to measure the systematic risk of a firm. They argue that stock that face high systematic risk should earn higher premium as a compensation for the risk it bears. So, stocks that have high BE/ME ratio, earns higher return because they have higher systematic risk. Providing the economic reason for the story of value premium, Fama and French (1995) and K. Chan, Hamao, and Lakonishok (1991) holds that distress factors in the economy for the above average return of value stocks. The risk spread between value and growth stocks is low, when the economic conditions are good and this spread is large in the times of bad economic condition (N. Chen & Zhang, 1998). According to Petkova and Zhang (2005), investors expected market premium is low in good times and during this phase of the economy, growth stocks are riskier than value stocks and opposite is true in bad times. Liew and Vassalou (2000) also advocates the risk based hypothesis of value premium. Hahn and Lee (2006) argue that the risk attached to the variation in default and term spread is generating value premium.

Doukas, Kim, and Pantzalis (2002) reject the extrapolation hypothesis of Lakonishok et al. (1994) by providing evidences which indicate that over optimism in the analysts forecast of EPS does not derive value premium. The subsequent study of Doukas, Kim, and Pantzalis (2004) suggest that value stock earns higher return because it is compensation for stocks that have higher dispersion in analysts' forecasts, thus supporting the risk based explanation of value premium. Finally, the research of Lettau and Wachter (2007) finds that value stock has higher correlation with cash flow, whereas, growth stocks have higher correlation with discount rate.

Along with the debate regarding the source of value premium, literature have also discussed the value-growth indicators that produces higher value premium. Value-growth indicator that produces higher value premium varies from country to country (Fama & French, 1998)². Cashflow to price and book to market ratio generates higher return in Japan for 1971 to 1988 (A. Chen & Tu, 1993), whereas, sales to price ratio for the period of 1983 to 1996 (Suzuki, 1998). Sales to price ratio had also been found as superior value-growth indicator in U.S market from 1970 to 1991 (J. Barbee et al., 1996), for the European market for the period of 1989-2004 (Bird & Casavecchia, 2007a, 2007b) and for U.K market (Leledakis & Davidson, 2001). Whereas, the study of Dimson et al. (2003) finds that divided yield (D/P) and book to market ratio plays an important role in explaining the cross section of stock return for period of 1955 to 2001 in U.K market. Dividend yield generates superior return in Greece stock market for 1995 to 2002 (Kyriazis & Diacogiannis, 2007). The most efficient value-growth indicator for the U.S market is sales to price and cash flow to price ratio (Dhatt, Kim, & Mukherji, 2004). Earning to price ratio when used

²Out of the 13 stock markets analyzed by the study of Fama and French (1998), in six of the markets i.e. UK, Japan, U.S, Switzerland, Belgium and Singapore, book to market ratio is the superior value-growth indicator for the period of 1975 to 1995. Whereas in the stock market of Australia, Germany, Hong Kong and Italy, cash flow to price ratio is the best value-growth indicator. In the stock markets of Sweden and Netherland, earning to price ratio generated greatest value premium, whereas in France the same was done by dividend to price ratio.

as value-growth indicator, generates higher return in Canadian market (Athanasakos, 2009), whereas, Fama and French (1998); O'Shaughnessy (2005); argue that as compared to other value-growth indicators, portfolios formed on the basis of book to market ratio provides higher return because of the level of volatility attached to this measure. It is because book value of the firms is comparatively less volatile than cash flow or earnings of the firms, resulting in more certainty for investors. However, as compared to sales value of a firm, the book value of equity is affected more by firm specific factors and therefore, sales to price ratio may be more reliable value-growth indicator (J. Barbee et al., 1996). Chahine (2008) suggests using multiple value-growth indicators, as single indicator may not provide appropriate results, because each indicator depicts the different perspective of the firm. Additionally, a book to market multiple indicating undervaluation in a company producing consumer electronics may not indicate the same for a mining company. In the light of the above discussion, this paper evaluates the performance of the six value-growth indicators in generating value premium.

Data and Methodology

Sample Selection

Daily stock returns for the listed from year 2001 to 2014 are used in this study. Best, Best, and Yoder (2000); Fama and French (1993) suggests that the multiples of financial and non-financial sectors are not comparable, therefore, the inclusion of financial sector along with non-financial sector might lead to biased results. This was also acknowledged by Best et al. (2000); Bird and Casavecchia (2007a). The study of Yen et al. (2004) argue that the capital structure of both these sectors is different, leading towards biased conclusion. Therefore, this study has only included non-financial firms in sample. Huang, Yang, and Zhang (2013) argue that negative multiples cause noise to the sample, therefore, they were excluded from the sample. Stocks that satisfied the following criteria were selected.

- The firm must be a public limited company listed at Pakistan Stock Exchange.
- The firm must not belong to a financial sector.
- Stocks with negative value growth indicator were not included in sample.

Based on the above given criteria of sample selection, Table 1 summarizes the number of firms selected each year for each value-growth indicator. In order to avoid survivorship biasness, this study have not followed the conventional sample selection procedure i.e. to select the firms that have survived for the full sample period of the research. Instead, this study has applied the sample selection criteria for each year, leading to different number of firms for each indicator for each year. There are six value-growth indicators used in this study, therefore, based on the sample selection criteria, six different samples are formed. As firm A may have negative book to market ratio and hence be excluded from the sample when book to market ratio is used as value-growth indicator, but may be included in the sample when some other indicator is used. The minimum number of firms included

in the sample are 199 in year 2001 for Book to market portfolio and maximum number of firms selected based on given criteria are 343 for sales to price portfolio in year 2003. On average, lowest number of firms are for dividend to price ratio as compared to other indicators. This is because low number of firms announce dividend and the firms that did not pay dividend during a specific year were excluded from the sample. Whereas, sales to price ratio when used as value-growth indicator yields highest number of firms.

Table 1
Number of selected firms for each value-growth indicator

Year	B/M	E/P	D/P	CF/P	GP/TA	S/P
2001	199	168	130	179	202	230
2002	257	227	163	214	263	307
2003	284	252	167	249	293	343
2004	285	262	138	276	290	342
2005	290	270	149	285	297	343
2006	295	257	137	281	303	341
2007	280	220	118	250	266	324
2008	236	184	104	217	236	271
2009	285	198	120	232	288	331
2010	288	245	171	263	298	332
2011	287	238	164	263	297	330
2012	283	231	163	258	281	323
2013	276	245	166	258	287	317
2014	283	236	161	262	291	321

This table represents number of firms for portfolios formed on the basis of book to market (B/M), earning to price (E/P), dividend to price (D/P), cashflow to price (CF/P), gross profit to total assets (GP/TA), and sales to price ratio (S/P) for each year.

Portfolio Formation

This study used the methodology of [Dimson et al. \(2003\)](#) in order to construct the Fama and French factors. There are three factors in Fama and French model i.e. market premium, size premium and value premium. Market premium was calculated as the difference between the market return (KSE 100 index in this case) and the risk-free rate (T-bill rates by State Bank of Pakistan). Size of the firm was calculated by multiplying the number of shares outstanding of a firm to its yearly closing price and the value factor was calculated using the six value-growth indicators used in this study.

This study first sorted the stocks in ascending order on the basis of size, for each year. At the end of December each year t , the study sorted all the firms in a year t based on end of December market capitalization (i.e. closing price on the last trading day of year t multiplied by number of ordinary share on last trading day of year t). The sorted firms were then divided into two portfolios i.e. small and big portfolio for being above or below 70th percentile. Firms having market capitalization below 70th percentile were categorized as small firms and firms with market capitalization of more than 70th percentile were categorized as big firms. The small and big portfolio were then sorted on the basis of a value-growth indicator. As there are six value-growth indicators used in this study, therefore, six different samples were formed. The objective of this study was to evaluate the performance of six value-growth indicators i.e. book to market, earning to

price, cash flow to price, dividend to price, sales to price and gross profit to total assets³. These indicators were separately used as opposed to forming a composite measure. The small and big portfolio were separately then sorted in ascending order using these value-growth indicators. Both small and big portfolios were then divided using the value-growth indicator further into three portfolios i.e. low (L) represents the firms with low value of value-growth indicator, medium (M) represents the firms with medium value of value-growth indicator and high (H) represents the firms with high value-growth indicator. The low (L) portfolio consists of 30% of stocks with low value-growth indicator, next 40% with medium value-growth indicator were included in (M) portfolio and the remaining 30% stocks were allocated to high (H) portfolio. This methodology lead to the formation of six portfolios i.e. small-low (SL), small-medium (SM), small-high (SH), big-low (BL), big-medium (BM), big-high (BH).

Table 2
Minimum and maximum number of firms in each portfolio

Portfolio	B/M		E/P		D/P		CF/P		GP/TA		S/P	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
SL	66	83	61	80	29	48	52	76	65	82	76	96
SM	33	40	29	39	14	23	16	37	31	41	37	48
SH	66	83	61	80	29	48	52	76	65	82	76	96
BL	29	36	27	35	13	21	14	33	28	36	33	42
BM	13	17	12	17	06	10	10	15	14	17	16	20
BH	29	36	27	35	13	21	23	33	28	36	33	42

This table represents minimum and maximum number of firms for portfolios formed on the basis of book to market (B/M),earning to price (E/P),dividend to price (D/P),cashflow to price (CF/P),gross profit to total assets (GP/TA) and sales to price ratio (S/P) for each year. The six portfolios are small-low (SL), small-medium (SM), small-high (SH), big-low (BL), big-medium (BM), big-high (BH).

Table 2 represents the minimum and maximum number of firms included in each portfolio for each value-growth indicator. The maximum number of firms i.e. 96 are included in SL and SH portfolio for sales to price ratio whereas, minimum number of firms i.e. 06 selected are in BM portfolio for dividend to price ratio.

After formation of the six size-value portfolios, the daily value weighted returns were then calculated for each portfolio for time t to $t + 1$. Daily averages were calculated for the entire six portfolios. Average of all the small portfolio and big portfolios were calculated on daily basis. The difference between the average of small portfolio and big portfolios forms the SMB factor.

$$SMB = Average (SL, SM, SH) - Average (BL, BM, BH)$$

To estimate HML, the averages were calculated for daily returns on the high value-growth indicator and low value-growth indicator portfolios. The difference of these two averages forms the HML factor.

³This paper defines book value of equity as total assets minus total liabilities and preferred equity, sales as the revenue generated through sales within the year, earning as net profit after interest and tax, cashflow as cashflow from operations.

$$HML = \text{Average}(SH, BH) - \text{Average}(SL, BL)$$

Results and Discussion

Table 3 presents the descriptive statistics for size premium, value premium and market premium (the return on the market portfolio minus the risk-free return proxied by treasury bill rate) for the period starting from January 2001 to December 2014. The descriptive statistics are included for the portfolios formed on the basis of book to market, earning to price, dividend to price, cashflow to price, gross profit to total assets and sales to price ratio. The return represented in the table are daily value weighted returns.

Panel A of Table 3 represents the results for portfolios sorted on book to market equity. The analysis reveal an insignificant size premium is 0.006 percent per day, whereas, a significant positive value premium of 0.043 percent when the widely-used value-growth indicator i.e. book to market ratio is used. However, the study [Hassan and Javed \(2011\)](#) reported a negative size premium (-0.0004 percent) and a positive value premium (0.0056 percent) for the period of 2000 to 2007. Additionally, a positive size premium (0.012 percent) and negative value premium (-0.065 percent) was reported by the study of [Mirza and Shahid \(2008\)](#) for the period of 2003 to 2007 using the data of Pakistan Equity Market. Except of book to market and sales to price ratio, size premium is positive and significant suggesting that small firms earn higher return as compared to big firms. Both of these studies used book to market equity as value-growth indicator.

Results of this study are consistent with the [Mouselli \(2010\)](#); [Dimson et al. \(2003\)](#) who reported a positive size and value premium for UK market. Value premium had also been found positive in U.S. ([Fama & French, 1992, 1993](#)) and for other countries except for Japan ([Capaul et al., 1993](#); [Fama & French, 1998](#)).

Value premium is highly significant and positive for all the value-growth indicators. Earning to price ratio when used as value-growth indicator earns highest value premium of 0.13 percent. Interestingly, book to market ratio and sales to price ratio generates lowest value premium and amount these two indicators, book to market ratio have higher standard deviation suggesting that risk adjusted return of book to market ratio would further be lower.

So, for Pakistan Equity Market, earning to price ratio generates highest value premium. Comparing the results with the study of [Fama and French \(1998\)](#), they found in the stock markets of Sweden and Netherland, earning to price ratio generated greatest value premium whereas, in UK, Japan, U.S, Switzerland, Belgium and Singapore, book to market ratio is the superior value-growth indicator for the period of 1975 to 1995. Furthermore, in the stock market of Australia, Germany, Hong Kong and Italy, cash flow to price ratio is the best value-growth indicator., whereas in France the same was done by dividend to price ratio.

This study further tests whether the FF three factor model can explain the portfolio returns of value and growth stocks and to test the validity of the FF model. The regression results of each of the six portfolios return (i.e. SL, SM, SH, BL, BM, BH) and the combined

Table 3
Descriptive statistics for Fama and French
Three Factors

	SMB	HML	RM-RF
A. Portfolios Formed on B/M			
Mean	0.006	0.043	-0.029
SD	0.900	0.669	5.010
Maximum	5.377	6.548	39.61
Minimum	-6.430	-4.270	-247.2
t-statistics	0.877	9.223	-0.824
B. Portfolios Formed on E/P			
Mean	0.022	0.138	-0.090
SD	0.930	0.705	6.233
Maximum	5.938	9.368	28.31
Minimum	-6.702	-4.774	-247.2
t-statistics	3.347	27.82	-2.060
C. Portfolios Formed on D/P			
Mean	0.040	0.085	-0.078
SD	0.941	0.708	5.702
Maximum	5.236	6.321	21.57
Minimum	-6.433	-8.072	-255.8
t-statistics	6.102	17.04	-1.945
D. Portfolios Formed on CF/P			
Mean	0.025	0.117	-0.076
SD	0.960	0.663	5.876
Maximum	5.705	4.881	27.20
Minimum	-5.445	-5.134	-247.278
t-statistics	3.685	25.22	-1.854
E. Portfolios Formed on GP/TA			
Mean	0.024	0.065	-0.103
SD	0.949	0.838	6.401
Maximum	7.479	7.923	18.19
Minimum	-6.786	-5.932	-254.9
t-statistics	3.592	11.10	-2.287
F. Portfolios Formed on S/P			
Mean	0.006	0.040	-0.043
SD	0.935	0.588	5.478
Maximum	5.726	3.452	51.51
Minimum	-7.005	-2.470	-254.9
t-statistics	0.892	9.651	-1.125

This table reports the descriptive statistics for Fama and French three factor model. SMB (small minus big) represents the size factor, HML (high minus low) represents the value factor and RM-RF represents the market factor. B/M, E/P, D/P, CF/P, GP/TA and S/P are the portfolios formed on book to market, earning to price, dividend to price, cashflow to price, gross profit to total assets and sales to price ratio.

returns of all these six portfolios on FF three factor model is reported in the Table 4. The Fama and French three factor assumes that the intercept term should be insignificantly different from zero (statistically zero) and the coefficients of the three factors should be

significantly different from zero (statistically different from zero). If the intercept term is not statistically equal to zero, then it might suggest that part of the value and growth portfolios return is not explained by the FF model.

The analysis presents interesting results regarding the validity of the three-factor model. The three factors significantly explain the portfolio returns irrespective of the value-growth indicator used except for the book to market value growth indicator in which case the HML factor does not explain the return of SL and BL portfolios and in case of cash flow to price ratio where size factor does not explain the return of SH portfolio. Using the daily return of 81 financial and non-financial firm from Karachi Stock Exchange, [Mirza and Shahid \(2008\)](#) also suggests that HML factor, when constructed using book to market as value-growth indicator does not explain the return of SL portfolio.

The results of size premium on the portfolio returns presents mix results. Ideally, the SMB coefficient should be positive for the small size portfolios and negative for big size portfolios. The SMB coefficient is positive for SH portfolio when stocks are sorted on the basis of earning to price and dividend to price and cash flow to price ratio. When gross profit to total assets is used as value-growth indicator, SMB coefficient is positive for all small size portfolio and negative for all big size portfolios representing the situation advocated by the rational of size premium. In case of book to market and sales to price ratio, SMB coefficient is negative for all the six portfolios.

Similarly, the HML coefficient should be negative for SL and BL portfolios where as positive for SH and BH portfolios. The results are almost consistent in case of HML factors, which is negative for both SL and BL portfolios where as positive for SH and BH portfolios. Interestingly, the R^2 of the model increases as the analysis moves from growth stock to value stocks representing that the FF three factor model is better predictor of value portfolios as compared to growth portfolios. Additionally, when using R^2 as an indicator, the FF factors when formed on the basis of gross profit to total assets ratio, have more predictive power as compared to other value-growth indicators.

In addition to estimating the regression of individual six portfolios returns on the FF three factors, Table 4 also presents the regression of the combined returns of all the six portfolios i.e. SL, SM, SH, BL, BM, BH on FF three factors. The result reveals that SMB factor have negative effect on stock returns irrespective of the value-growth indicator used. HML factor is positive and statistically significant for all the indicators used in this study. Whereas the intercept term is insignificant only for the gross profit to total assets portfolio hence fulfilling the assumption of the test.

Additionally, R^2 highest when gross profit to total assets ratio is used as value-growth indicators and lowest when dividend to price ratio is used. Overall the empirical evidences reported in this study supports the existence of value premium irrespective of the value-growth indicator used to form portfolio. Additionally, value premium is positive and significant for all the indicators.

Table 4
Regression of individual portfolio returns on three factor model

α	β_{MKT}	β_{SMB}	β_{HML}	$t(\alpha)$	$t(\beta_{MKT})$	$t(\beta_{SMB})$	$t(\beta_{HML})$	R_2	N	
A. Portfolios Formed on B/M										
SL	0.014	0.033	-0.163	-0.029	0.98	10.4	-10.3	-1.39	0.07	3399
SM	0.024	0.027	-0.113	0.374	1.42	8.04	-5.91	14.66	0.09	3390
SH	0.033	0.034	-0.129	1.004	2.44	11.8	-8.34	49.16	0.44	3400
BL	0.034	0.035	-1.22	-0.022	2.28	10.31	-73.13	-1	0.63	3396
BM	0.035	0.027	-0.984	0.455	2.09	7.32	-51.89	18.19	0.49	3387
BH	0.009	0.016	-1.16	0.899	0.61	6.46	-68.05	39.46	0.65	3395
P	-0.021	0.651	-0.082	0.265	-3.58	110.91	-8.88	30.19	0.56	20367
B. Portfolios Formed on E/P										
SL	0.03	0.017	-0.099	-0.304	2.07	7.43	-6.26	-14.63	0.07	3392
SM	0.03	0.018	-0.122	0.165	1.8	7.07	-6.74	6.95	0.05	3380
SH	0.073	0.025	0.031	0.563	5.26	9.34	2.04	28.49	0.21	3399
BL	0.079	0.024	-0.946	-0.422	5.36	8.57	-58.94	-20.21	0.53	3393
BM	0.038	0.017	-1.224	0.147	1.84	6.72	-55.94	5.11	0.5	3383
BH	0.026	0.018	-1.044	0.627	1.69	7.5	-62.78	28.81	0.63	3394
P	0.046	0.019	-0.569	0.13	6	15.28	-68.56	11.97	0.23	20341
C. Portfolios Formed on D/P										
SL	0.034	0.031	-0.053	-0.293	2.31	10.98	-3.28	-13.79	0.08	3384
SM	0.067	0.024	-0.068	0.153	3.79	7.48	-3.52	5.99	0.03	3384
SH	0.069	0.027	0.057	0.662	4.75	9.4	3.61	31.69	0.25	3389
BL	0.086	0.023	-0.919	-0.338	5.38	7.95	-52.76	-14.71	0.47	3386
BM	0.038	0.022	-1.029	0.276	1.76	6.41	-44.76	9.07	0.42	3372
BH	0.037	0.022	-1.062	0.657	2.4	9.19	-63.31	29.64	0.65	3385
P	0.055	0.024	-0.513	0.186	7.03	17.63	-59.92	16.49	0.21	20300
D. Portfolios Formed on CF/P										
SL	0.004	0.032	-0.126	-0.107	0.31	10.9	-8.88	-5.29	0.07	3395
SM	0.055	0.011	-0.083	0.232	3.4	4.95	-4.97	9.66	0.04	3392
SH	0.055	0.024	0.01	0.726	3.98	9.23	0.71	35.32	0.29	3398
BL	0.077	0.027	-1.012	-0.303	5.25	9.29	-65.79	-13.81	0.58	3395
BM	-0.003	0.013	-1.075	0.285	-0.17	4.52	-56.7	10.45	0.52	3382
BH	0.011	0.018	-1.099	0.802	0.77	7.58	-71.43	36.37	0.68	3392
P	0.033	0.018	-0.566	0.273	4.51	14.82	-73.77	24.84	0.26	20354
E. Portfolios Formed on GP/TA										
SL	-0.007	0.013	0.026	0.134	-0.58	6.76	1.93	8.87	0.04	3396
SM	0.028	0.024	0.078	0.428	1.73	6.82	4.44	21.46	0.14	3389
SH	0.016	0.01	0.242	1.177	1.06	4.33	15.34	65.5	0.56	3398
BL	0.027	0.013	-0.752	0.173	1.66	4.66	-43.51	8.79	0.41	3397
BM	0.005	0.027	-0.763	0.634	0.29	6.77	-38.65	28.28	0.49	3377
BH	-0.004	0.005	-1.01	1.045	-0.28	3.54	-73.47	66.8	0.79	3391
P	0.011	0.011	-0.368	0.603	1.45	9.17	-46.02	66.35	0.3	20348
F. Portfolios Formed on S/P										
SL	0.017	0.034	-0.115	-0.206	1.17	10.51	-7.19	-8.3	0.08	3402
SM	0.038	0.019	-0.079	0.206	2.22	7.23	-4.31	7.09	0.03	3383
SH	0.033	0.035	-0.083	0.877	2.29	10.68	-5.15	35.07	0.28	3401
BL	0.044	0.019	-1.188	-0.163	2.88	8.2	-70.74	-6.15	0.62	3394
BM	0.024	0.026	-1.009	0.383	1.16	5.84	-45.05	10.99	0.4	3392
BH	0.017	0.022	-1.051	0.637	1.11	8.29	-63.18	24.33	0.57	3398
P	0.029	0.025	-0.589	0.289	3.83	17.91	-71.02	22.22	0.23	20370

This table reports the regression coefficients of portfolio returns on Fama and French three factors. SL represents the small size and low value-growth indicator portfolio, SM represents small-medium, SH represents small-high, BL represents big-low, BM represents big-medium, BH represents big-high and P represents the combined return of all these six portfolios.

Conclusion

Fama and French (1992) following the study of Banz (1981) (for size effect) and Rosenberg et al. (1985) (for value effect) identified two risk factors that can explain the cross-sectional variations in stock return left unexplained by the beta. Fama and French (1992) used book to market ratio for categorizing stocks into value and growth firms. Researches conducted on this area identified that the value-growth indicator generating superior return varies from market to market. Therefore, the aim of this study was to evaluate size value-growth indicators i.e. book to market, earning to price dividend to price, cashflow to price, gross profit to total assets and sales to price ratio. In line with the aim, this research first tested whether value effect exists in Pakistan equity market and to identify the value-growth indicator that generates superior return.

Using the daily stock return from year 2001 to 2014, this study reports a strong value premium for Pakistan Stock Exchange. Value premium is positive irrespective of the value-growth indicator used, however, book to market ratio generates the lowest value premium (after sales to price ratio), whereas earning to price ratio produces higher value premium. Hassan and Javed (2011) reported a positive value premium for the period of 2000 to 2007 whereas, a negative value premium was reported by the study of Mirza and Shahid (2008) for the period of 2003 to 2007 using the data of Pakistan Equity Market. Additionally, gross profit to total assets when use as value-growth indicator can explain more variations in stock returns whereas, dividend to price ratio have lowest explanatory power of all the proxies used.

This paper is written for two different audience. Firstly, for the investors, investment and portfolio managers use different stylized investment strategies, value and growth strategy is one of the investment strategy. They are interested in the performance of the value and growth portfolios. Results of this study suggests that investors should not solely focus on book to market ratio while formulating portfolios based on value-growth investment strategy, they should also consider other indicators such as earning to price ratio specifically for Pakistan Stock Exchange. Additionally, investors, portfolio managers and corporate managers should incorporate size and value premium along with market premium while pricing the asset or estimating the cost of equity. This study also helps in developing style based benchmarks to scrutinize the performance of investment strategy. The second audience of this paper are academicians, who are curious for last two decades regarding the above average performance of value stocks.

This study has formed portfolios using value weighted approach, however, the disadvantage of value weighted portfolios is that it is dominated by large size stocks. Therefore, it can be an interesting avenue to test the robustness of these results by forming portfolios using equal weighted approach. Additionally, the value-growth indicators selected in this study presents the information of value and growth firms from different aspects, hence combining this information in composite value-growth indicator would have implication for future research.

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