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Financial Distress premium in Pakistan's Banking Stocks

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ABSTRACT

This paper examines the role of financial distress premium in explaining the stock returns of banking sector in Pakistan using the sample of twenty listed banks for the period of 2008 to 2018. The study has used two methodologies. Firstly, multifactor model approach of Fama and French (1992) is used to test the financial distress premium (additional risk factor) where portfolio returns are regressed with factor premiums in time series framework. Fama and French (1993) argue that the relationship between the stock return and the selected characteristics occur for that reason these characteristics are proxies for non-diversifiable factor risk. So, the characteristic based model approach of Huang (2009) is used in cross-sectional regression framework where stock returns are regressed with the characteristics. The results indicate that the proposed four factor model is applicable in the banking sector of Pakistan where financial distress premium is priced by the market. The characteristic based model shows insignificant impact of distress proxy of Altman Z score on the banking returns. It suggests that the cross-sectional returns are explained on the covariance structure of returns not the characteristics in the Pakistani banking stocks. The findings of the study suggests that the financial distress is important and consider while forming their portfolios.

Key Words: Financial distress Premium, Characteristics Model, Risk Factor Premium, CAPM, Banking sector

1. INTRODUCTION

Financial institutions play a significant role in the development of financial markets in any country. The development of this sector is always a debatable topic in the financial literature. Historical experience is evident that whenever the financial system

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collapse it will create panic in the overall economic condition of the country. From the last couple of decades, the financial distress of financial institutions is a major concern of policymakers which affects the performance of other sectors as well as the returns of the financial institutions.

Financial distress risk is referred to a business condition where a firm is unable to pay its debt or credit obligation till maturity. This situation may be temporary, and, in some cases, companies do not meet these obligations in the long run. It is a crucial phase for the businesses and lead towards bankruptcy. The main parties who will suffer from financial distress risk are financial institutions and capital providers (i.e. shareholders and bondholders). Financial distress risk is a systematic risk as this is within the system of companies and cannot be avoided (Chen & Zhang, 1988). The distress risk can predict the financial failure effectively (Shen, 2020).

A risk-based explanation suggests that due to the riskiness of stocks those who are in high financial distress will earn a high return in the future. In case of behavioral explanation, it is a fundamental role that the prices of stocks will converge towards its mean in future and remove the arbitrage and the distressed firms does not earn high returns due to its misvaluations (Dichev, 1998; Campbell, Hilscher & Szilagyi, 2011). Eisdorfer, Goyal and Zhdanov (2018) report that in such markets the financial distress risk is higher where the financing is easily available and tight legal framework for takeovers and the possibility of arbitrage is higher. The previous studies argue contradictory results to the asset pricing principle that firms with high financial distress have low returns as compare to the low financial distress firms (Kim, Lee, & Na, 2019; Kim & Lee, 2020).

This paper also focuses on the size and value premium on banking stock returns. Banks having small market capitalization earn higher returns as compared to large banks, because small banks have high risk as compared to large banks (Gandhi & Lusting, 2015). Small size banks are naturally riskier in comparison to the large banks because the given risk characteristics differ in terms of operations, financial risk, and the liquidity. Numerous studies have already reported that the banks are smaller in size has less liquidity and are often inattention from the analysts and institutional investors (Amihud &

Mendelson, 1986; Edmister & James, 1983; Arbel, Carvell & Strebel, 1983). Moreover, small sizes banks are highly distressed as shown by their high BE/ME ratio. When the BE/ME ratio is higher it means the targeted firm is cheap and performing not better than those having low book to market ratio (Fraz, 2017; Chughtai & Hasan, 2016).

Financial institutions are mostly excluded from asset pricing analysis because of the difference in their capital structure and are not considered while considering the non-financial firms for assets pricing analysis (Fama & French, 1992). Modigliani and Miller (1963) argue that when capital structure changes that firm risk profile based on beta also changed but it does not mean that it violates the principles of capital asset pricing model (CAPM). So, CAPM may also applicable to the financial firms. Barber and Lyon (1997) find no difference in the risk factors both between financial and non-financial firms.

In this study financial distress risk factor is incorporated as an additional factor in Fama and French three factor model to check cross sectional variation in return for banking stocks in Pakistan. This study has also used the characteristic based model on banking stock return in Pakistan. The findings of the study have contributed significantly to different perspectives. This study is helpful for fund managers, investors, and corporate managers to manage their portfolios and asset valuation. This study is meaningful for pricing decisions and the determination of the fair value of securities. It provides insight to investors about risk model performance while making investment decisions in the context of the Pakistan financial market.

The rest of the paper follows the following outline. The literature review which provides empirical evidence, then data description and methodology which covers the discussion on data and methods used in the study, after that results analysis and discussion are presented based on the analysis and finally Conclusion section will conclude the findings of the paper.

2. LITERATURE REVIEW

The financial distress risk is the source of systematic risk. Systematic risk factor such as size, BE/ME ratio and financial distress risk contribute to price financial asset and estimate their expected return. The contributions of Fama and French (1992, 1993,

1996) proposed a significant alternate model based on the APT framework for asset pricing known as Fama and French three-factor model. According to Fama and French three-factor model market premium, size premium and value premium define stocks return. Fama and French (1992) first time found that stock market Size and BE/ME ratio has significant high explanatory power in explaining stock returns variations. The study has reported that these factors determine equity returns. Fama and French models have been tested worldwide in several markets, but very little work has been done in Pakistan.

Firms' categorization based on market capitalization with small size will perform better as compared to the large firms (Banz, 1981). The performance and stock returns of firms having small market capitalization will high than large, capitalized firms because of the compensation of an additional risk factor. Mselmi et al. (2019) argue that financial distress factor is significantly priced only in the absence of the size and book to market ratio. SMB and HML include important information related to financial distress risk and hence are proxies for the financial distress risk (Vassalou & Xing, 2004).

Fama and French (1993) employee time-series approach to extend their work by studying both stock and bonds. The findings of Lam (2002) also affirms that size, BE/ME and E/P could better explain cross-sectional fluctuations in stock returns, but the solely beta is not able to explain the variation in the stock return. The high book to market (BE/ME)¹ ratio has low power to predict the firm future earnings and it is hypothesized that it captures the financial distress risk which is priced by the equity returns (Fama & French, 1995). Size premium has a strong root in Pakistan equity market whereas premium based on BE/ME is positive and significant for overall stocks except those possessing low BE/ME ratios (Hassan & Javed, 2011). Further studies measure the financial distress risk to predict the excess return in comparison to the BE/ME ratio (Griffin & Lemmon, 2002 and Campbell, Szilagyi & Hilscher, 2005). The results confirm the anomalous behavior of financial distress risk.

Morelli (2007) contradicts the findings of Lam (2002) and reports an insignificant relationship. Size and value effect exist in Australian equity market also

¹ Book to market ratio reflects the difference between book value of common equity reported by financial statements under GAAP and what market assesses to be the economic value of common equity. High book to market ratio stocks referred to undervalued while low ratio referred to overvalued stocks.

Fama and French three-factor model better explain equity return and has more power in explaining equity return than traditional CAPM (Halliwell, Sawicki, and Heaney ,1999). Later on, Drew and Veeraraghavan (2003) affirm the findings of Halliwell and Sawicki (1999) and find a significant impact of size and value premiums on stocks return. Zaremba (2017) has reported that four factor model of Carhart (2007) perform poorly in explaining in stock returns on the Polish market. Fraz and Hassan (2016) examine the multifactor model for Pakistan stock market by adding an additional factor information efficiency premium and suggests that size, value and information efficiency premium is priced by Pakistani stock market. Rafique et al. (2019) confirm the findings of Stivers (2018) and report the existence of ICAPM in Pakistan stock market.

Hameed, Qarni, and Shafi (2018) investigate the applicability of Fama and French's three-factor model for four Asian(Karachi, Bombay, Dhaka, Colombo) stock markets. By analyzing monthly stock returns of 60 firms from each of the four stock markets for the period of 2003 to 2011. Their study reports the presence of size and value premiums and confirms the FF three-factor model validity for these markets and can explain the return variations. Boubaker , Hamza, and Garcia (2018) also suggested that a systematic process is required for the formation of local or international portfolio by considering size and value premiums

Financial distress refers to the business having difficulties doing business and facing problems like insolvency and leads to the liquidation of business (Khoja et al., 2019, Kim and Lee, 2020). There are number of models available to predict firm's future financial distress. Such as Altman Z-score, CLSA stress test, CAMEL etc. Altman model is a linear model assigned with different weights. Mossman et al. (1988) have compared different bankruptcy models and rank the Altman Z score at the top because of its wide range built in ratios and reported that it predict better than CAMEL (Kusdiana, 2014). In order to measure and predict the likelihood of financial distress for financial firms, Prime Altman Z-Score is developed (Altman & Hotchkiss, 2006).

Shoaib and Siddiqui (2017) conduct a study to identify the adjustment pattern of stock returns (India, Pakistan and China) and concluded that in the Chinese market, all the risk factors play their role to determine risk premiums. However, in India and

Pakistan, the risk premium is mostly determined by market risk factors. Maiti (2019) presents the review on the evaluation of different risk factor models and reported that more than 300 risk factors have been identified by the previous studies. The evolution of risk factors and factor models are continuous and endless and it is impossible to have a stable efficient factor models that can explain stock market risk return relationship globally in long run. As the return of financially high distress firms and low distress firms are not same therefore on the basis of financial distress risk we can form arbitrage portfolio which return are higher than risk adjusted rate of return. The current study will also contribute to the literature of size premium, value premium and financial distress premium for financial sector.

3. RESEARCH METHODOLOGY

3.1. Data Description

The study has examined the role of size, value and financial distress factors for financial sectors in Pakistan by employing data of all listed commercial banks at PSX for the period of 2008-2019. The population of the study is all listed commercial banks at PSX while sample size comprised of 20 listed commercial banks. Six-month T-bill is used as a risk-free rate. The study only considered financial sector because the capital structure of both sectors are different. Also closing period for financial sector is December while non-financial sector accounting period closes in June. The data is collected from official website of State bank of Pakistan, B-recorder, financial statements of the banks and other websites.

Market capitalization is used as the proxy of size Fama and French (1992, 1993, 1996). It is measured by using the following formula:

$$\text{Size} = \text{No of shares outstanding} \times \text{MPS} \quad (1)$$

Value premium has been introduced by Rosenberg in 1985. For value premium book to market ratio is calculated by using the following formula:

$$\text{Book to market (BE/ME) ratio} = \frac{\text{Book value of equity}}{\text{Market value of equity}} \quad (2)$$

Financial distress measures the probability that a firm may default in the future, hence measures the firm's future performance. Two proxies are used in this study for

measuring financial performance of the banks. One is Altman's Z score while other is CAMEL model

$$Z \text{ score} = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 \quad (3)$$

Where, X_1 = Current ratio which is (current assets – current liabilities) and scaled by total assets, X_2 = retained earnings and scaled by total assets, X_3 = earnings before interest and taxes and scaled by total assets, X_4 = leverage and is book value of equity / total liabilities. If Z score is greater than 2.6 it indicates it is in safe zone, ranging from 1.1-2.6 indicated grey zone and less than 1.1 is declared as danger zone.

3.1.1 Portfolio Construction

In construction of portfolios for analysis the median is used to sort the portfolio based size-sorted which is calculated on market capitalization for all the 20 banks and then data is arranged in descending order. Then divide it in two equal parts the 10 banks have market capitalization less than the median is called "SMALL" while remaining 10 banks have market capitalization above the median is called "BIG".

In value sorted portfolios 10 small and 10 big banks are further sorted based on BE/ME ratio value. When "SMALL" is sorted based on BE/ME ratio, it forms two portfolios labeled S/H (having small size and high ratio of BE/ME) and S/L (having small size and low ratio of BE/ME). When BIG is sorted based on BE/ME ratio it also forms two portfolios named B/H (consist of stock having large size and high ratio of BE/ME) and B/L (consist of stock having large size and low ratio of BE/ME).

Z score of each bank is calculated through the Altman Z" score model. After calculating Z score all the banks are arranged in descending order based on Z score value and two portfolios are formed named H/R and L/R. 10 banks having high financial distress risk are named as H/R while remaining 10 have low financial distress risk named as L/R.

3.2. Methodology

Ross (1976) states that stock returns depend upon several factors and are not affected only by a single factor. The contributions of Fama and French (1992, 1993, 1996) proposed a significant alternate model based on the APT framework for asset

pricing known as Fama and French three-factor model. According to FF three-factor model market premium, size premium and value premium define stocks return. The current study has added one additional factor financial distress premium.

In the second step the characteristics-based model is used, the characteristics model explains excess return by stock characteristics. Huang (2009) challenge that the FF three-factor model and propose characteristics-based model as compare to factor based. The data for this model is panel which has both the characteristics of cross section and time series. To analyze the panel data correctly, it is important to know the method of panel data. These methods are classified into three categories as Common constant model, fixed-effect method, and random effect method.

The OLS method is used to determine the line of best fit for a set of data. To check the validity of whether the fixed-effect method or OLS method should include in the model is better, the standard F -test can be used. In the fixed-effect model, the individuals within the measurement set have a unique attribute that does not vary across time. The fixed effect model is as follow:

$$Y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_k X_{kit} + \mu_{it} \quad (4)$$

The individuals in the random-effect model have unique, time constant attributes that are not correlated with the individual regressors. The random effects model is also known as the Error Component Model (ECM) or Generalized Least Square (GLS) technique. The random effect model is as follow

$$Y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_k X_{kit} + (V_i + \mu_{it}) \quad (5)$$

3.2.1 Econometric Model:

Risk Factor model predicts that cross sectional variation in expected stock returns is due to factor loadings. The following equations are used:

$$R_i - R_f = \alpha + \beta_1 MKT_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 HRMLR_t + \varepsilon_t \quad (6)$$

Where, MKT is the difference between the expected return on a market portfolio and the risk-free rate. The return of market portfolio is calculated by using formula.

$$R_m = l_n(P_t/P_{t-1})$$

R_m represents the market return for the month "t". P_t and P_{t-1} are closing prices of PSX. The risk free rate is denoted by R_f . The $SMB = 1/2 * [(S/H - B/H) + (S/L - B/L)]$, Where, SMB = small minus big, S/H= portfolios holding small size and high ratio of BE/ME, B/H= portfolios holding big size and high ratio of BE/ME, S/L= portfolios holding small size and low ratio of BE/ME, B/L = portfolios holding big size and low ratio of BE/ME. The value premium is calculated by $HML = 1/2 * [(S/H - S/L) + (B/H - B/L)]$, Where, HML = high minus low, S/H = portfolios holding small size and high ratio of BE/ME, S/L = portfolios holding small size and low BE/ME, B/H = portfolios holding big size and ratio of high BE/ME, B/L = portfolios holding big size and low ratio of BE/ME. Then financial distress premium is estimated based on both the models, Z score $HRMLR = HR - LR$ Where, HR = portfolio possessing high risk and LR = portfolio possessing low risk.

For characteristic model by using factor against the individual banks returns Size, BE/ME ratio, and Z score is used. The econometric model under characteristic model is calculated as

$$R_{it} = \alpha + \beta_1 \ln(R_{mt}) + \beta_2 \ln(Size_{it}) + \beta_3 \ln(BTM\ ratio)_{it} + \beta_4 \ln(Zscore_{it}) + \varepsilon_{it} \quad (7)$$

Where, R_{it} = return of bank stocks "i" for period "t" and the return of market portfolio is calculated by using $R_m = \ln(P_t/P_{t-1})$ formula. R_m represents the market return for the month "t". P_t and P_{t-1} are closing prices of PSX. Size is market capitalization, BTM ratio is book to market ratio and Z-score is Altman Z-score.

4. RESULTS AND DISCUSSION

4.1. Descriptive Statistics

The study examines behavior of data to check its accuracy before applying regression test. Descriptive statistic shows the general behavior of data including all the variables. The mean value shows the average of data and standard deviation shows deviation from mean. The descriptive statistics table along with mean and standard deviation also include Skewness, kurtosis, maximum and minimum values.

Table 1. Descriptive Statistics for all Portfolios							
Portfolios	Mean	Median	Std.	Kurtosis	Skewness	Mini	Max
P	0.003	-0.003	0.066	1.093	0.099	-0.208	0.193
S	-0.000	-0.002	0.083	3.713	0.861	-0.234	0.381
B	0.006	0.005	0.063	0.574	-0.058	-0.183	0.167
S/H	0.000	-0.002	0.100	4.429	0.960	-0.249	0.472
S/L	-0.001	-0.003	0.078	2.403	0.032	-0.256	0.289
B/H	0.009	0.011	0.065	0.914	-0.129	-0.200	0.184
B/L	0.003	0.000	0.071	0.900	0.178	-0.199	0.220
HR	0.003	0.006	0.063	0.636	-0.201	-0.206	0.146
LR	-0.001	0.000	0.077	2.445	0.618	-0.210	0.309

**Note: P portfolio consists of all stocks(arranged in descending order with); S portfolio consists of first 50% stocks of P portfolio having small size; B portfolio consists of remaining 50% stocks of P portfolio having big size, HML = high minus low, S/H = portfolios of those stocks holding small size and high ratio of BE/ME, S/L = portfolios of those stocks holding small size and low ratio of BE/ME, B/H = portfolios of those stocks holding big size and high ratio of BE/ME, B/L = portfolios of those stocks holding big size and low ratio of BE/ME.HR portfolio having stocks of high risk(first 50% of P) and LR portfolio having stocks of low risk (remaining 50% of P).*

The descriptive statistics in Table 1 exhibit that mean ranges from -0.000(S) to 0.009(B/H). The mean for P is 0.002 and for B is 0.006. Similarly mean for S/H, S/L and B/L are 0.000, -0.001 and 0.003, respectively. Likewise mean for HR and LR are 0.003 and -0.001. The minimum and maximum values also showing the normal distribution of data. Standard deviation representing scattering of data ranges from 0.063 (B/H) to 0.100 (S/H). Kurtosis having value of 3 or more is said to be platykurtic which is less peaked and have a thinner tail. Skewness shows the data distribution. The table indicates that data are mostly positively skewed i.e right tail is longer than left tail. Table 2 evaluate the statistical behavior of different portfolios based on market premium, size premium, value premium and distress risk premium.

Table 2. Descriptive Statistics of the Risk Factor Premiums				
	MKT	SMB	HML	HRMLR
Mean	0.007	-0.007	0.004	0.004
Median	0.012	-0.013	0.004	0.004
Std. Dev	0.054	0.067	0.044	0.050
Kurtosis	0.236	8.515	2.774	4.384
Skewness	-0.100	1.134	-0.515	-0.408
Mini	-0.122	-0.265	-0.185	-0.232
Max	0.171	0.375	0.125	0.189

**Note: MKT: market return, SMB: small minus big, HML: high minus low, HRMLR: high risk minus low risk*

The above table indicates that size-based portfolio premium incurred an average loss of -0.7%. The average risk of the portfolio is 6.7%. The maximum return earned in a month is 37.5% and maximum loss incurred in a month is 26.5%. Further statistics show that the kurtosis of the portfolio is 8.515 which is more than 3 so return are peaked. Also, the data is positively skewed as Skewness is 1.134. Value based portfolio premium earn an average return of 0.4%. Variability in the return is measured with the standard deviation which is calculated as 4.4%. The maximum loss incurred in a month is 18.5% while maximum return earned in a month is 12.5%. Skewness of the data is -0.515, which tells that data is negatively skewed. Kurtosis is approximately 2.8 shows that the data is peaked and asymmetrically distributed.

Distress risk-based portfolio premium earned an average return of 0.4% in the month. Average risk of the portfolio is 5.0% estimated through standard deviation. The maximum return earned in a month is 18.9% while it incurred a maximum loss of 23.2%. The kurtosis is 4.384 therefore it is peaked and asymmetrically distributed, and Skewness is -0.408 indicating that data is negatively skewed or skewed left. The market premium based portfolio has the highest mean returns 0.7%. The value and distress-based portfolio premium has an average return of 0.4% and the size-based portfolio has a negative average return of 0.07%. The size-based portfolio premium assumes a high standard deviation of 6.7% compared to other portfolios. Table 3 exhibit the statistical behavior of data for characteristic model for the period of 2008 to 2018.

Table 3. Descriptive statistics of characteristics					
	Stock	Market	Size(million)	BE/ME	Z Score
Mean	0.092	0.215	52,889	1.302	1.169
Median	0.041	0.269	19,605	1.138	1.154
Std. Dev	0.392	0.252	72,813	0.757	0.441
Skewness	1.465	-0.027	0	4.905	5.162
Kurtosis	5.558	-1.497	0	1.890	52.355
Min	-0.723	-0.154	1,637	0.373	0.067
Max	2.341	0.586	400,817	4.912	5.741

The above table shows the descriptive statistics of stock returns, market return, size, book to market ratio and Z score. The annual average banking stock returns is

9.20% and the highest loss incurred in a year during the period is 72.3% and maximum profit in a year is 234% with the variation of 39.2%. The annual market return is 21.50 % and the highest loss incurred in a year during the period is 15.40% and maximum profit in a year is 58.6%. For size Skewness value is equal to zero show normal distribution indicating that data is symmetrical and bell-shaped graph. The average value of Z scores shows the sector average is in grey zone whereas the maximum value shows that banks are also in safer zone. Table 4 exhibits correlation among different risk factors.

Table 4. Correlation Analysis for Risk Factors

	<i>RMF</i>	<i>SMB</i>	<i>HML</i>	<i>HRMLR</i>
<i>RMF</i>	1			
<i>SMB</i>	0.060	1		
<i>HML</i>	-0.065	0.366	1	
<i>HRMLR</i>	-0.037	-0.681	-0.255	1

NOTE: *RMF*; market premium, *SMB*; size premium, *HML*; value premium, *HRMLR*; distress risk premium

The above table indicates that distress risk premium has negative correlation with size premium, value premium and market premium. Value premium has negative correlation with market premium while positive correlation with size premium. Also, size premium has positive correlation with market premium. Table 5 shows the correlation among different characteristics of stock.

Table 5. Correlation analysis for characteristic

	Size	BE/ME	Z Score	Ri	Rm
Size	1.000				
BE/ME	-0.450	1.000			
Z score	0.195	0.005	1.000		
Ri	-0.094	0.327	0.131	1.000	
Rm	-0.201	0.179	0.237	0.509	1.000

Note: Size; market capitalization, BE/ME; book to market ratio; Z score: distress risk; Ri: return on asset; Rm; market return.

The above table indicates that market return has negative correlation with size while positive correlation exists among asset return, distress risk and book to market ratio. Return on asset has negative correlation with size while positive with Z score and BE/ME. Book to market ration and size has negative correlation.

Table 4. Regression Results of Single and three Factor Model

	P	P	S	S	B	B
Constant	-0.003 (0.004)	-0.002 (0.003)	-0.007 (0.006)	-0.002 (0.003)	0.000 (0.004)	-0.002 (0.003)
β_1	0.940*** (0.067)	0.930*** (0.060)	0.977*** (0.102)	0.930*** (0.060)	0.903*** (0.065)	0.930*** (0.060)
β_2		0.233*** (0.052)		0.733*** (0.052)		-0.267*** (0.052)
β_3		0.139 (0.080)		0.139* (0.080)		0.139* (0.080)
Adj R ²	0.602	0.678	0.407	0.797	0.593	0.656
F sig	0.00	0.00	0.00	0.00	0.00	0.00

Note: P portfolio consists of all stocks (arranged in descending order with respect to size); S portfolio consists of first 50% stocks of P portfolio having small size; B portfolio consists of remaining 50% stocks of P portfolio having big size; β_1 -coefficient of Mkt; β_2 -coefficient of SMB; β_3 -coefficient of HML;; R²=Adjusted R square; F sig=F significance. Value enclosed in parenthesis report standard error. P<0.01*** p<0.05** p<0.1*

Table 6 exhibits the results of single factor CAPM and three factor model based on market premium, size premium and value premium. Result shows that market premium is significantly positive and explains 60.2% of the total variation in returns of portfolio of all the stocks at 99% confidence level so CAPM is a valid model for portfolios of all the stocks. Overall, when size premium is added, its effect on the portfolio of all stocks is significant. Similarly, the impact of value premium is insignificant. The results are in line with the previous study of (Hassan & Javed, 2011; Fraz & Hassan, 2016).

In small stock portfolios, market premium is significantly positive at 99% confidence level and explains 40.7% of total variations in return of small stock portfolios. Size premium has significantly positive impact on the return of small stock portfolios and explains 79.7% of total variation whereas value premium has insignificant impact on the returns of small stock portfolios. Results are in line with Chughtai and Hasan (2016). In big stock portfolios, market premium is significantly positive at 99% confidence level and explains 59.3% of total variations in return of portfolios. When size premium is added it has the significantly negative impact on the return and explains 65.5% of total variation in return of big stock portfolios. When value premium is added it has insignificant impact on portfolio of big stocks.

Table 7. Regression Results of four Factor Model

	P	S	B	S/H	S/L	B/H	B/L	LR	HR
α	-0.002 (0.003)	-0.002 (0.003)	-0.002 (0.003)	-0.004 (0.003)	0.000 (0.004)	0.000 (0.004)	-0.004 (0.003)	-0.002 (0.004)	-0.002 (0.004)
β_1	0.931*** (0.058)	0.931*** (0.058)	0.931*** (0.058)	1.050*** (0.062)	0.811*** (0.067)	0.811*** (0.067)	1.050*** (0.062)	0.781*** (0.072)	0.781*** (0.072)
β_2	0.091 (0.066)	0.591*** (0.066)	- 0.409*** (0.066)	0.730*** (0.070)	0.453 *** (0.076)	- 0.547*** (0.076)	- 0.270*** (0.070)	0.245*** (0.082)	0.245*** (0.082)
β_3	0.137 (0.077)	0.137* (0.077)	0.137* (0.077)	0.818*** (0.082)	- 0.544*** (0.089)	0.456*** (0.089)	-0.182** (0.082)	0.041 (0.096)	0.041 (0.096)
β_4	0.278*** (0.085)	0.278*** (0.085)	0.278*** (0.085)	0.099 (0.090)	0.457*** (0.097)	0.457*** (0.097)	0.099 (0.090)	0.633*** (0.105)	- 0.367*** (0.105)
Adj R ²	0.701	0.812	0.681	0.858	0.723	0.594	0.710	0.669	0.499
F sign	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: β_1 -coefficient of Mkt; β_2 -coefficient of SMB; β_3 -coefficient of HML; β_4 -coefficient of HRMLR; R²=Adjusted R square; F sig=F significance. Value enclosed in parenthesis report standard error. $P < 0.01$ *** $p < 0.05$ ** $p < 0.1$.*

Table 7 show the results of four factor model based on Altman's Z score analysis. Across all the portfolios market premium along with size premium show positive and significant relationship supported with R² ranging from 50% to 86%. Because small banks have high risk as compared to large banks (Gandhi & Lusting, 2015). Signs of coefficients for HML factor was negative for low BE/ME stocks (S/L) and was positive for high BE/ME stocks (S/H) indicating existence of value premium. Similarly, signs of coefficients for financial distress factor are positive for all portfolios except lower financial distress portfolio indicating existence of financial distress premium, results are inline with the findings of Kim and Lee (2020). The distress firms earn lower returns as compare to the safe stocks and the underperformance is worse (Shen, 2020). The R square of the models based on financial distress factor presented in table 7 is higher than the models presented in table 6. Table 8 exhibit the results of characteristics model based on Altman's Z score for all stocks for the period of 2008 to

2018. The results are in line with the argument that the risk premium has significant and positive relationship with stock returns.

Table 8. Regression Analysis for Characteristics Model based on Altman's Z score

	Coefficient	Standard error	P value		
Constant	-1.325	0.288	0.000	Adj R ²	0.363
β_1	0.906	0.097	0.000	F-statistic	25.963
β_2	0.050	0.011	0.000	Prob(F-statistic)	0.000
β_3	0.258	0.049	0.000		
β_4	-0.085	0.065	0.192		

Note: β_1 -coefficient of market return; β_2 -coefficient of size of stock; β_3 -coefficient of book to market ratio; β_4 -coefficient of distress risk; R²=Adjusted R square; F stat= F statistics

The above table indicates that the distress premium is insignificant, whereas market, size and BE/ME ratio is significant and positive. The explanatory power of model is 36%. Financial distress is unable to predict the stock return. Mselmi et al. (2019) argue that financial distress factor is significantly priced only in the absence of the size and book to market ratio. Previous studies suggest that financial distress risk to predict the excess return in comparison to the BE/ME ratio, because HML is also used as a measure of distress (Campbell, Szilagyi & Hilscher, 2005). The results confirm the anomalous behavior of financial distress risk.

5. CONCLUSION

This study has examined the multifactor model of Fama and French (1992) in asset pricing framework in Pakistani Banking sector from 2008 to 2018 by using different risk factors. These factors existence of market premium as well as size, value and financial distress premium is well supported with R square value ranging from 32% to 86%. Size premium is found significantly positively related to small size sorted portfolio returns but it is negatively significant for big size sorted portfolio returns. Value premium is found positive and significant for value stocks except growth stocks. So, it can be argued that size and book to market effect is present in Pakistan financial sector. These findings are consistent with the findings of (Hasan & Javed, 2011; Fraz & Hasan, 2016; Chughtai and Hasan (2016). Value stocks outperform growth stocks. When financial

distress premium is added the explanatory power of model is better than CAPM. The financial distress premium is influencing insignificantly on small stocks with high book to market ratio. In case of small stocks with low book to market ratio it is influencing significantly positive. For the big stocks, it is influencing significantly positive on stocks with high book to market ratio. The results are in-lined with Deb and Mishra (2019). Financial distress premium is positive and significant for stocks possessing low financial distress risk (L/R) and negative with high financial distress risk (H/R). The distress firms earn lower returns as compare to the safe stocks and the underperformance is worse (Shen, 2020). It indicates that financial distress factor is also priced in financial sector of Pakistan. The findings of the study further clarify that FF three factor and multifactor model significantly describes the portfolio returns of banking stock in Pakistan.

The estimated coefficients are also encouraging for the existence of all aforementioned factors. The MKT dominates other three factors across all the portfolios. The SMB is the second dominant across all markets. Coefficients signs were mostly positive for small portfolio and negative for large portfolio promising the presence of MKT and consistent with the FF proposition. Similarly, signs of coefficients for HML factor across all the portfolios was negative for B/L and S/L even though positive for B/H and S/H confirming the existence of HML. By comparing the beta's values of factor based model and characteristic based model we found that characteristic based model assumes lower risk. These results are helpful for decision makers and fund managers. Investors and corporate managers can use this model as an investment tool for managing their portfolios and determination of fair value of securities. From policy maker's perspective, a rationally explained size effect implies that the Pakistan financial market is becoming informationally more efficient over time. So, top management should account for Size, Value and Financial distress factors in their decisions regarding investment, financing, and valuation of securities.

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