Collaborative Impact of Leverage and Weighted Average Cost of Capital in an Asset Pricing Mechanism

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Abstract

The basic aim of this study is to analyze the collaborative role of leverage and WACC in the domain of asset pricing theory for which five factors augmented model is used to give more coherent explanation and to incarcerate the pattern in Size, Book to market, leverage and WACC. The basic stress of the study is also to ascertain the model that is best fit for describing average returns on the portfolio formed in different ways for which different version are also adopted to construct the factors. Monthly data of equity prices is used for the period of June 1998 to June 2016 for non-financial firms listed at Pakistan stock exchange. To strengthen the outcomes the Regressions are applied to have more detailed understanding into model performance specifically intercepts and its related slopes.The main significant results for all left hand side portfolios are analyzed and interpreted in the tests. The most exciting with remarkable interest, as compared to FF original three factor model the five factor model outperform on all ground and metrics and are also generally outperform other models. By and large, the pragmatic outcomes demonstrate the existences of these factors premium and significance of proposed asset pricing augmented model also increases.

Keywords: Asset Pricing Theory, Factors Model, systematic risk, Leverage effect, WACC effect.

Introduction

The modern finance theory laid down on three basic assumption which gives its foundation, these key stone assumption are; capital market are efficient, available arbitrage opportunities are exploited by investors and in making decisions, investor behave rationally (Dimson, 1999). In today's developed equity markets investors has to face a challenge to realize excess returns. According to the basic principle of financial economics is that the most risky assets are compensated with higher returns. The risk return relationship triggers the theoretical framework of assets and process of making investment decision in financial markets for which different models have been proposed by modern finance theory which has provided awareness into the financial decision making environment.

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Among most important paradigms in modern finance the efficient market hypothesis is one of them and has become the most interesting talk for finance community and lot of debatable discussion has been done by professional and academician since its advancement to explore the empirical results which are subjected to critical re-examination and the efficacy of EMH has gone astray based on primary evidences ,Hence, it can be concluded that in traditional modern finance paradigm it is difficult to tacit the total market conduct, average return's cross section, and investors' trading behavior. Therefore there is need for precise description of capital markets for such aspects.

At an earlier stage of its progress, the valuation of individual securities attracts and receives great dedications for which asset pricing theory appears to be more attentive. In more recent past, development in the technology and easy access to the pricing data motivated the academicians and financial analysts to switch their consideration towards more extensive parts of valuation procedures which performs a lively function in the development of financial market especially for derivative markets.

With the evolution of capital theory in 1964 it attracts the attention of many researcher, academicians and especial in later part of 20th century to examine the various aspect of asset pricing, different studies had been conducted by applying several statistical test (e.g. Fama & French three-factor model, 1992).A number of remarkable and amazing anomalies were discovered by empirical studies in finance during 1980s and early 1990s .In past few years these anomalies became too plentiful to ignore, indeed; these are well documented and also threatened the trustworthiness of EMH and did not gave persistent returns after some time as these differ with significance over the long-term. However, these variations have turned into the base for the quantitative type of investing tries to spot and abuse them, these differences have become into the premise. In modern finance the academicians and specialists acknowledges these factors and factor models (e.g. CAPM; APT; FF-three factor and five models, 1992, 2014; Carhart four factors model, 1997) as heart of current trading strategies.

In asset management these factor based models are utilized as a part of all stages, for example, portfolio development, portfolio determination, and execution assessment. Cross sectional qualities of stocks base the construction of these elements. In literature the most deliberated factors are size, value and momentum premium and so on. Primarily, to capture the economic insight these factors are identified. Secondly, they assist to understand the asset pricing with reference to their presentation to wellsprings of large scale financial stuns and security's integral risk.

The equity market of any country plays a vital role in financial and economic development of any country. Pakistan Stock Exchange has remained one of the best performing stock market of the world from more than half of the century. During the fiscal year 2016-2017 numbers of factors kept the foreign investors' attention on their domestic markets, rather than international markets, such as election in the Britain and US, Britain decision to take exist from European Union. In this scenario Pakistan stock exchange open benchmarked index at 37,966.76 during 2016-2017 fiscal year. The benchmark reached at 52876.46 points at highest point and slipped to 44,914.45. But at the end of year manage to close at 46.565.26 points. This rise and fall in stock market have depends on various factors which includes political instability, economic factors

and geopolitical factors. If excluding these are factors than stock market performance seems good. Unfortunately Pakistan stock exchange don't plays more significant role due to debt financing, foreign loan burden, various ups and downs in political situation of country. Because domestically stock market more depends on expectations. In the beginning of 1991 Pakistan stock market was opened for foreign investors than the market became actually active in progress, size and dept.

To withstand with business operations efficiently every organization need to raise their capital. To finance their assets base firms uses financial leverage which constitutes the best mix of capital so in finance the leverage is best system to build returns at generally safe or at low risk, if we have to comprehend the effect of leverage on risk-return. Therefore, leverage is viewed as the key wellspring of financial risk that could be the fundamental driver of indebtedness and bankruptcy of firms.

Cost of Capital often communicated as weighted average cost of capital states for the expected returns for majority of different securities issued by a company while required rate of return is compensation which investors necessarily demand for bearing risk on the investment and which can be establish for understanding business and financial risk. Cost of capital can vary in scope, perspective and use so WACC is very important figure for every company because for raising capital to make economic sense and firms investment decisions are always related to new projects which should always results in expected returns that exceed the WACC. Hence, cost of capital also effect on stock returns through investment decisions and is also important component of business valuation work because for investing in riskier assets investors demand higher returns, for justifying higher returns this risk premium arising from cost of capital is added in returns.

According to classical portfolio theory risk averse investors always take a portfolio which gives maximum risk adjusted return. The capital Assets Pricing model explained that risk and portfolio return have affected by solely the market premium. However Ross stated that there are other several factors which significantly affect the risk and portfolio returns. In previous research various studies have been commenced to provide an insight how so many factors impact on equity returns such as, size, debt, growth, profitability, industrial production and book to market ratios, i.e. (Iqbal et al., 2013; Borys, 2011; Butt and Rehman and Hunjra, 2010; Lee and Jang, 2007; Rehman and Baten, 2006; Boynton and Oppenheimer, 2006). But few studies have under taken with leverage as factor of asset pricing in Asian markets.

This study is an effort in an asset pricing domain to propose an alternative model by incorporating leverage and weighted average cost of capital over and above the market, size and value factors that have helpful for giving the rational explanation of cross-sectional differences in asset returns. However, in Pakistan no detailed study is conducted to explore the collaborative role of leverage and cost of capital in asset pricing and its impact on equity returns. By and enormous, outcome rational explanation of asset pricing differences has possible. This means abandoning the rational asset pricing paradigm could also be premature. Therefore, Fama and French's (1992, 1993) model can be replicated by inculcating new non-conventional factors suggesting a more robust explanation of systematic risk.

Moreover, Behavior of Pakistani market is also a matter of interest for investors. The differences in capital market regulations, corporate governance practices, and economic parameters may also have a significant impact on the risk

factors relevance. This study also has aims to explore the degree of relevance of these factors and their pricing in equity market of Pakistan.

Review of Literature

How prices are dogged in an uncertain world is elucidated by asset pricing theory. For measurement of systematic and idiosyncratic risk several alternative proxies have been recognized since the development of asset pricing theory. Equally, the systematic risk is un-diversifiable and it is compensated by extra risk premium that entails the pricing of risk in stock returns (Sharpe, 1964). For risky asset the clarification of the cross sectional expected returns becomes easier as a result of the precarious contributions of the risk premium accompanying with these size, book to market, and momentum factors. In the ensuing areas, the thorough evaluations on the current experimental studies are given on the new introduced risk factors. Review on each underlying factor is presented here distinctly to make sure easiness in readability.

Leverage and Asset Pricing

Business activities usually financed through a combination of debt and equities known as capital structure. The importance of leverage in capital structure is much more significant but existing literature is mostly equipped with the determinants through the capital structure and part of financial leverage in assets pricing has been to a great extent overlooked. However, the empirical confirmations concerning the relationship among variety in stock returns and financial leverage are exist. This segment revealed somewhere in the range of a review of existing writing on money related use (financial leverage) and stock returns.

In 1958 the Modigliani and Miller proposed that with raising financial leverage in firm's capital structure expected return on equity should increment and this proposition was further confirmed by many researchers such as Hamada (1969), associated the Modigliani - Miller recommendation with the capital asset pricing model (CAPM) of Sharpe (1964) and Lintner (1965), by proposing that company's beta increases with increase in financial leverage and this financial risk arising from leverage is use is caught by the beta coefficient, if CAPM holds and subsequently left a requirement for a different risk premium factor. Bhandari (1988) suggested that leverage should be incorporated as a separate autonomous risk factor since it is valued in stock returns. Fama and French (1995) suggested that these three factors model has more logical control on the grounds that the money related risk emerging from increment in leverage has been caught from size and book to market factor and value factor as of now catch the financial distress so financial leverage ought not be estimated as a different risk factor. The importance of company's leverage and relative misery in asset pricing was described by Ferguson and Shockley, (2003) by arguing that proxy identification is important because CAPM was proved failure in capturing the market returns because the proxy used constitute only equity investment and ignore the debt claims. They also explored that in explaining cross sectional variations in returns, the informative power of single factor model increased augmented by leverage and distress. In the same lines, the study of Vassalou and Xing (2004) also estimated the default risk as a systematic risk and stated that default factor arising from financial leverage, three factor augmented model is a superior indicator of equity returns. Leverage work like double edge sword; it is favorable if it brings an increase in firm's

revenue but will be unfavorable if increases the risk of insolvency and bankruptcy. Similarly relationship of financial leverage, personal taxes and corporate taxes for investor on the cost of equity was examined by Dhaliwal, Heitzman and Zhen (2006) and found positive relationship between equity cost and leverage that describe the firms demand higher risk with higher leverage but found negative relationship among equity premium and corporate taxes. Besides, outcomes revealed that increase in leverage leads to increase in equity cost. Though, some of the leverage related equity premium would be offset with the benefits which emanates from the existence of tax shield. Penman et al. (2007) further analyzed the connection of leverage with stock returns and examined by decomposing the proportion of book to market into two segments: enterprise book to price, and leverage. They found the positive connection between operating risk and returns and also examined negative connection of leverage among stock returns. A study conducted by Campbell et al. (2008) gave challenges for future research by reasoning that size and value factor do not represent trouble risk and investor require risk premium for stock which are financially challenged. In domain of same, Wah et al.(2008) also explored the impact of corporate financial leverage on asset pricings and on restricted estimations their outcomes inferred that leverage is a priced factor alongside beta, size, and book to market when analyzed separately for bullish and bearish markets. George and Hwang (2010) also empirically evaluated the connection between stock returns, leverage and distress force and watched a negative connection between stock returns and distress force or intensity and proposed that based on distress cost, firms maintain their capital structure. Sivaprasad, &Muradoglu, (2012) also examined the connection between stock returns and leverage in the cross sections of all firms. They also found robust result by testing empirically MM II proposition which states that returns increment in leverage Mirza et al. (2013) investigated the impact of leverage on stock returns in asset pricing to examine that whether leverage is priced or not and found significant leverage premium for sample stock. Leverage has somewhere control on firm's value and the firm's value affected by leverage level (Ramadan, 2015). In capital structure the increasing level of leverage or debt diminish the firm's profitability (Habib et al., 2016).Mirza et al. (2016) analyzed the pertinence of financial leverage and default possibility for asset pricing in a rising economy for which they utilized an amplified Fama and French model. They came about the important findings that they have not found any favorable support for CSPM based risk premium and also found solid centrality of size, value and firm particular financial leverage risk premium in stock returns implies all they are deliberate in nature but market risk premium is not pertinent factor. Researcher has made many studies to examine the effect of leverage on the firm's value for long, yet at the same time a subject of contention and difference among scientists and fact finders exist . Following hypothesis has been constructed based on reviewing the theoretical review and presented literature:

Hypothesis 1: There exists a positive relationship between leverage premium and stock returns.

Cost of Capital and Asset Pricing

In developing countries, every organization faces different tasks exposed to variety of risk ,among them especially acquisition and securing of funds is an exceptionally troublesome assignment especially in the light of cash deficiencies and variety of its

cost and, the level of risk related with each kind of fund. This task ended up being considerably more troublesome even with organization management in developing nations. Asset pricing model of Fama and French considered that factors other than market risk effects the stock returns but they did not incorporate the information risk and maintained that information risk is diversifiable in efficient portfolio and should not demand a risk premium. But opposite view was given by Easley and O'Hara (2004) by examining that cost of capital can influenced by information structure surrounding the stock returns. they examined theoretically that due to information asymmetry poses greater risk to unaware investors making them unable to readjust their portfolios according to full information existing in the market so this situation arise some sort of systematic risk which unaware investors cannot diversify so they demand greater amount of returns in the exposure of information risk.) information risk is systematic in nature as the information risk has direct linkage with cost of capital (Lambert et al. 2007), Assuming fixed availability level of certain information in the market, increased level of information asymmetry leads to higher cost of capital (Hughes et al., 2007; Safdar and Chen., 2016), information precision effect firm cost of capital and through better disclosure the firm can reduce its cost of capital (Lambert et al. 2012).

There are two main sources of financing debt and equity financing and among different decision for the money procurement the recognizable proof of funding type and proportion of each fund type is the important decision. In deciding both company's genuine esteem and systematic and nonsystematic hazard level the Miles and Ezzell, (1985) investigation demanded at construction a finance theory by measuring the linkage between firm's market value and financial leverage value which uncovered vigorous consequence of connection between cost of capital and financial leverage.Returns on investment str affected by cost of capital and financial leverage and its increases as the firms derives benefits from using debt but dependences on debt also increases the risk of insolvency or bankruptcy [Kane et al, (1989), Smith et al, (1990), Al Agha, (2005)] opportunity cost also effected that well incite defeating investment issues to some degree and high risks debts may discourage investment (Bitro and John, 2001) WACC has critical connection with stock market returns, where the obligation financing has more warmth stocks market return appeared differently in relation to inside equity financing (Kareem, 2006).

Numerous studies (e.g. Lang et at., 1996; Aivazian et al. 2003; Aivazian et al., 2005; Chava and Roberts, 2008; Polk and Sapiennza, 2009; Badertscher et al., 2013; Campello and Graham, 2013; Ramalingegowda et al., 2013; Goodman et al., 2014; Shroff et al., 2014) also accept that investment is an element of various investment opportunities which are measured by different arrangement of variables. along these lines, the financial performance, tax and financing cost effected by financing choices so the financial structure is considered as essential component in surveying and measuring corporate financial performance as it is hard to discuss an economic corporation without financial structure (Abdel Ghani, 2008). Al-Tamimi, &Obeidat, (2013) think about and recommended that expanded utilization of money related use (perusing the ideal capital structure for the tax saving advantage driving eventually to augmenting degree of profitability in stock. Presently in the wake of taking a short audit of existing writing about leverage and its effect on company's execution or performance, productivity, market value included however no broad

examination is finished by cost of capital in asset pricing space. In this way there is needed to examine the pricing mechanism in these business sectors or markets. Along these lines, it can be guessed that cost of capital premium has likewise positive and huge effect on equity returns. To look at the impact of cost of capital on stock returns, we test the accompanying hypothesis.

Hypothesis 2: There exists a significant relationship between WACC premium and stock returns.

Data and Research Methodology

The fundamental determination of the present investigation is to think about the illustrative power of Fama and French three factor model with projected five factor models. In this manner, the investigation utilizes the similar approach utilized by Fama and French (1992) to sort stocks however the plan of portfolios and factors depends on model of Fama and French (2015). The study then prolongs the model by three-three, three-four and five factor model for testing the GRS but the basic concern remain on the comparison of three factor to five factor augmented model with leverage and weighted average cost of capital factors.

Data Description

All listed firms at Pakistan stock exchange are the population of study in the examination excluding the financial sector. The investigation utilizes a data collection of 250 non-financial listed firms for the period of 1998-2016. The reason to choose this period is that the data for Pakistan Stock Exchange (PSX) is accessible in advanced shape just for this period. The reason behind utilizing market index is that it has sensitivity to every single macroeconomic factor and henceforth some basic variations will brings about an adjustment in market index. The month to month index prices have been collected from the business recorder and KSE site. Data about all necessary fundamental variables has been extracted from published financial reports. To be qualified for incorporation in *t+1*, the chosen stocks have principal information accessible in sample in a specific year *t*. Conferring to Fama& French (1992) and Davis et al. (2000) that Sample size and time period has momentous impact on experimental outcomes inferred. Hence, to alleviate this problem the study employs a dataset of 19 years.

Sample Construction and Preliminary Screening

A very common criterion used in asset pricing for selection has been applied in this study. To attain the vigorous and comparable estimates the study follows prevailing practices. Additionally, the sample assortment criterion employed here for investigation are in accordance with methodology embraced by Fama and French 1992 and FF five factors model.

Final criterions are used for financial sample selection:

1. All the companies are non-financials in nature sharing the same accounting year.
2. Firms selected for sample are also similar based on composition of asset and structure of ownership (none of these organizations having foreign stake over 10%). This gives us assurance that we don't need to control for any huge variety in these qualities.

3. Prior to the incorporation of non-financial firms in the sample, they ought to be listed for a period of more than two year. Only those organizations are viewed as that have in one year no less than 90% of non-zero returns to avoid any biasness in results.
4. Firms having negative book to market equity are excluded to get meaningful book to market variable. Therefore, just firms with positive BV/MV are joined in test. The issues are because of strange state of firms.
5. Financial data such as market capitalization and stock prices available in market for the sample firms of the study and all the data about necessary fundamental variables have been extracted from published financial reports. For Pakistan, monthly stock prices have been obtained from Business Recorder website. Index data has been taken from Yahoo Finance site, whereas monthly data of risk free rate has been taken from IFS database as these sources of information are considered reliable.

Portfolio Construction

The pragmatic research in the domain of asset pricing employs firm specific characteristics to elucidate the differences in cross sectional return and its affectability (Fama and French, 1992, 1993, 1996, 1998, and 2014; Carhart 1997). The portfolio construction procedure includes following main hub steps:(i) To form the portfolios, securities are ranked with same characteristics.**(ii)** Based on size the sample stocks of all companies are joined and classified and to examine the five factor model empirically and models that incorporate subgroups of its factors that clarify portfolio's average returns on framed to create vast spreads in size, B/M, leverage and WACC.**(iii)**Average month to month percent excess retunes for portfolios framed on size and B/M, leverage and cost of capital.**(iv)**At the ending of each June, Stocks are given in descending arrangement based on their market capitalization to create size-sorted variable. Stocks are allocated to five size groups (Small to Big) on the basis of market capitalization break points. Again to create B/M groups, stocks are further allocated independently to create five B/M groups (Low to High).This intersection will create (5x5) 25 value weighted SIZE-B/M portfolios.**(v)**In the same way the 25SIZE-LEVERAGE and 25SIZE-WACC portfolios are developed, except that the second sort variable will be leverage or weighted average cost of capital. These are rebalanced each year in June in view of their particular market value of equity, book to market ratio, and financial leverage and WACC. The previously mentioned technique is applied for 1998 to 2016, and portfolios have been made.

On the basis of this sorting averages of monthly returns will be calculated but these calculations do not isolate value, leverage and cost of capital impacts in average returns. To unravel the dimension of average or normal returns the portfolio can be sorted together on size, B/M, LEVERAGE and WACC. Indeed, 3x3x3x3 sorts, though, generate 81 ineffectively broadened portfolios that have low power in test of asset pricing models (Fama& French 2015). This study also compromises with sorts on size and pairs of the other three factors just like as done by Fama and French (2014). Following the same, Sorting is done on two size groups (small and big), utilizing middle market capitalization for PSX stock as the cut-off point and to shape four groups for each of the other two sort variable quartiles of PSX has been utilized. The same tactic portfolios have been constructed for each variable of combination

2x4x4=32 portfolio and also to spread more evenly the study also uses separate breakpoint for small and big stock in the sorts on B/M, LEVERAGE and WACC .

Factors Construction

This study observes that to incarcerate the patterns in normal returns in test of asset pricing models whether the particulars of factor production are imperative; the current study uses three different sets of factors used such as 2x3, 2x2, and 2x2x2x2 sorts according to the tactic given by Fama and French 2015.For each version separate sorting is done for example separate 2x3 sorting is done on size and B/M or leverage or WACC same as for 2x2 sorts and 2x2x2x2 sorts is used to check the joint effect of variable of size, B/M, leverage and WACC. Estimation Techniques

This process as follows:

This section of estimation process for the study entails the measurement of multivariate regressions. To test the asset pricing model by estimating the regressions to get further detailed understanding into model performance specifically intercepts and its related slopes over the sample period and where we used factors as independent variable and portfolios returns as dependent variable. Regression intercepts and their pertinent coefficient for the entire left hand side portfolio such as 25SIZE-B/M, 25SIZE-LEVERAGE, 25SIZE-WACC, 32SIZE-B/M-LEV, 32SIZE-B/M-WACC and 32SIZE-LEV-WACC, has been described in individual tables. This section will provide more examples of multivariate regression slopes that whether they confines up with uni-variate attributes or not .

Model Specification

To test the asset pricing mechanism in equity market of Pakistan the following baseline model will be used augmented with our new proposed factors. The study attempts its best to identify factors that will be valuable in clarifying the cross sectional difference in returns in developing new model.

Experimental and Extended Framework:

The regression equation OLS, that is intended to be assessed separately of the portfolios is represented as follows.The basic traditional econometric form of Fama and French three factor model is expressed as:

$$R_{pt} - R_{ft} = \alpha + \beta_1 MKT_t + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_t \quad \text{.....(1)}$$

The following five factor augmented model is proposed for experiential testing.

$$R_{pt} - R_{ft} = \alpha + \beta_1 \text{MKT}_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 HLMLL_t + \beta_5 HWMLW_t + \varepsilon_t \quad \text{.....(2)}$$

Where: R_{pt} Is expected Return of portfolio 'i' for period 't', R_{ft} = Risk free Rate, MKT_t = Market Premium = $R_m - R_f$, SMB_t = Size premium = (Small – Big) returns of small size portfolio less the return of big size portfolios at time "i", HML_t

= Value premium = Return of high BV/ME Ratio less the Return of low BV/ME Ratio at time "i", $HLMLL_t$ = Leverage premium = Return of high Leverage firms less the Return of low leverage firms at time "i", $HWMLW_t$ = $wacc$ premium = Return of high $wacc$ less the Return of low $wacc$ at time "i", α = The management's impact (Alpha), β_1 = Factors beta or factors loading, e = Term of random error, $\beta_1, \beta_2, \beta_3$ Are factor loading for market, size, value, leverage and cost of capital premium respectively .

In light of month end prices, the logarithmic returns of the security i at t will be computed by assuming continuous compounding.

$$R_{i(t)} = I(PI_t / P_{t-1})$$

Where $R_{i(t)}$ stand for return for stock i in month t whereas $P_{i(t)}$ and P_{t-1} correspond to price for stock i in month t and $t-1$ correspondingly. These individual returns are then used to gauge value weighted portfolios that are developed utilizing the accompanying structure. Similarly, to calculate, month to month returns of the market, month end closing index values of PSX are adopted and above declared approach have been utilized to measure return series for market index .

$$R_{\mathrm{m}(t)} = I(I_t / \mathrm{I}_{t-1})$$

Where, $R_{\mathrm{m}(t)}$ = continuously compounded Monthly return for market index at month t, I_t = Closing Index value of the KSE-100 on last trading day of month t, I_{t-1} = Closing Index value of the KSE-100 on last trading day of month $t-1$

Results and Discussion

Interpretation of Table 4.3:

Table 4.3 illustrates the descriptive statistics for the factors returns and data regarding average returns on the portfolio utilized to create these factors are given in appendix table A1. Intended for the three sorts the average returns for SMB factors ranges from 0.07% to 1.22% per months and standard deviation of SMB are also like the similar, 4.64% to 17.69% (Panel A of Table 4.3). Descriptive statistics mainly affected by sorting or different version adopted to construct the $HML, HLMLL$ and $HWMLW$. Comparison between 2x3 sorts and 2x2 sorts are easier.as due to better diversification the three factors has lower standard deviation when merely two groups of B/M , $HLMLL$, $HWMLW$ are used because factors constitutes all stocks when sorted on 2x2 base. Similarly factors constructed on 2x3 sorts produce larger spread as they do not include stocks in the medium 40% of B/M , $HLMLL$,

$HWMLW$ because they focus more on their extreme values and creates higher average returns. For example the average returns for value in 2x2 sort is6.08%per month as compare to the average returns7.79% in 2x3 sorts. Same pattern of differences can be viewed in other factors returns. The T-statistics for the factors average returns are also no doubt not similar in all sorts but its results have remarkable impacts to have conclusive expressions. In 2x2 and 2x3 sorting each factor is controlled for size and one other variable but in 2x2x2x2 sorting factors jointly controls for all four variables. Joint control has negative effect on $HLMLL$ reruns (-.002), as same negative case is in 2x3 sorting also usually such type of the expression do not show coherence among supporting components but here the situation is little bit unique because of multicollenearity.

Small and big stock portfolios basically used to construct the value, leverage and cost of capital factors. Here again, to check the joint control effect for small and big stock premiums, following results shows interesting discussion for such changes (In Panel A of Table 4.3). Research results in Panel B of Table 4.3 shows that smaller stock has larger value premium which also confirm the previous study of (e.g., Fama and French 1993, 2012; Loughran 1997).As the research data depicts that average returns of HML_S , 0.29% per month (T=94.33%) is greater than the average return of HML_B , 0.09% per month (T=20.46%) for 2x3 sorts constructed to $size - B/M$. Same results can be viewed for 2x2 and 2x2x2x2 sorts. Value premium will be stronger for big stock if leverage and cost of capital is controlled but Value premium for small and big stock, the joint control for leverage and cost of capital does not brings decrease in the spreads as the difference between HML_S and HML_B increases from 0.23% (T=51.46%) in 2x2 sorts to 0.81% (T= 45.65%) in 2x2x2x2 sorts. this analysis inculcate that value premium have high influence on all sorts. For 2x2x2x2 sorts there expected a leverage premium for smaller stock as the average value of $HLMLL_S$ is much greater and its average means value is also positive but for 2x2 and 2x3 sorts no leverage premium is expected for smaller stock because of having negative average returns and t values. Overall the leverage premium is larger for smaller stock than big stock in 2x2x2x2 sorting only and is negative for other sorts but results indicates that this larger expected premium is not so strong the difference between small and bigger leverage portfolios in 2x3 and 2x2x2x2 sorts are much higher. Similarly $wacc$ premium for smaller stock is also expected for all sorts of factors construction because of having positive average returns and t value. As results shows sturdy confirmation that the probable $wacc$ premium is better for smaller stocks in 2x3 and 2x2x2x2 sorts except in 2x2 sorts where bigger stocks has larger $wacc$ premium than smaller stock. The average value of $HWMLW_S$ is 2.08 but the average value of $HWMLW_B$ is only 2.77%per month (T=2.73) in 2x2x2x2.Usually from diversification point of view both 2x2 and 2x2x2x2 sorts gives similar result pattern but the outcome of the study not endorsed the same because of the other macroeconomic factors. Panel C of Table 4.3 illustrates the correlation matrix between

different versions of the same factor. Overall Results shows that SMB factors sorted on 2x3 is negatively correlated with 2x2 and 2x2x2x2 sorts but positively correlation has been found between 2x2 and 2x2x2x2 sorts. Such behavior revealed that size leverage and $wacc$ highly correlated in all sorts which show the effectiveness of the use of different versions. Panel D of Table 4.3 shows the correlation matrix involving different factors of all sorts2x3, 2x2, and 2x2x2x2. Results shows that MKT is negatively correlated with SMB in all sorts except 2x3 where it is positively correlated. SMB is negatively correlated with $HLMLL$ in all sorts but positively in 2x2x2x2 sorts. HML is negatively correlated with $HLMLL$ in 2X3 and 2x2x2x2 sorts but positively in 2x2 sorts. $HLMLL$ is also negatively correlated with $HWMLW$ in 2X3 and 2x2x2x2 sorts but positively in 2x2 sorts .

Interpretation of Table 4.4:

Six different lay downs of left hand side portfolios have been regressed against the three sets of rights hand side factors for these seven models. The basic logic is to make the sense for model's restriction that price relatively fit in the tests. Baseline model the FF (1993) three-factor model basically augmented with leverage and cost of capital factor to judge the improvements for addition of these factors. Table 4.4 shows the summary statistics for the inventive baseline model of Fama and French (1993), the three-four factor models and the five factor augmented model for all the six left hand side portfolio and factor of different version on right hand side. But here results reported for elective three factor model just for the 5x5 sorts on $size-leverage$ and $size-wacc$ and only for the model in which third factor $HLMLL$ *or* $HWMLW$ is intended at the next left hand side sort variable.

When an asset's excess returns are regressed on the model's factors returns than intercept sought to be indistinguishable from zero it means an asset pricing model is completely capturing the expected returns. GRS statistics of Gibbons, Ross and Shanken (1989) is utilized to examine this proposition for the combinations of the entire left hand side portfolios and right hand side factors. The outcome are detailed in table 4.4 explains that all models are accepted by GRS test for which all left hand side portfolios and right hand side factors are considered except the $size-B/M$ portfolios. If all the intercepts are zero than the GRS statistics must be larger than the one observed it is confirmed through the probability or p-value here which endorsed the results. However we can report that P-value for four of the six sets of left hand side portfolio returns are round to zero to at least two decimal for all models except in $25\,size-B/M$, and $25\,size-lev$ portfolios however, $25\,size-B/M$, and $25\,size-lev$ portfolio, models price best in the tests but have insignificant p-value.

Results also proves that the average absolute intercepts, $A|\alpha_i|$, are too greater for the five factor model but it shows the similarity when taken up to three decimal in remaining all sets of portfolios. Comparative to the FF three factor models, the slightly remarkable enhancement in the average absolute intercepts are formed by the five factor model when applied to $32\,size-B/M-lev$, *and*

$32\,size-lev-wacc$. It is worth mentioning that since these portfolios are shaped on two factors ($leverage$ and $wacc$) even not specifically focus by the three-factor model rather the outcomes propose that FF three factor model is probably going to passage ineffectively when connected to portfolio with solid $leverage$ and $wacc$ tilts. Although competing models effectively explain the average returns, however in support the further additional two ratios has been calculated to check the proportion of cross section of the expected returns by the contending models. The results of two ratios are given in table 4.4. To measure the ratios for different given models the measure of dispersion of intercept by a set of left hand side portfolios and dispersion of left hand side expected returns are used as nominator and denominator respectively. The result of $A|\alpha_i| / A|\bar{r}_i|$ in table 4.8 shows that the average absolute value of five factors intercepts $A|\alpha_i|$ ranges from 1.01 to 2.53**,** for all left hand side portfolios and factors of different versions. Hence if measured in terms of returns data revealed that impressive distribution of average excess returns by five factor model in contrast to three factor model. Measuring of dispersion in this way does not matter, even though not calculated by CAPM for same data with all left hand side portfolio and factors returns the intercepts will have more dispersion than average returns without having its dependency on method of quantification.

Now the proportion of change of expected returns of left hand side portfolios which are endorsed by competing models are measured by this $A(\hat{\alpha}_i^2) / A(\hat{u}_i^2)$,ratio of averages. $A(\hat{\alpha}_i^2) / A(\hat{u}_i^2)$ has explain better and provide positive picture for results of five factor model as compared to $A|\alpha_i| / A|\bar{r}_i|$ as it deliver results in units of return squared and also been corrected for sampling error. Estimation shows that cross section changes of expected returns endorsed the results, the five factor model leaves unremarkable cross section variation of expected returns and the portfolio sorted on 5x5 ($size-wacc$) poses the prevalent challenge. For $25\,size-B/M$ and $25\,size-lev$ portfolios, these estimates also have the similar expression strengthening the overall spectrum.

Prema-faco expression estimates also describes that in explaining the cross sectional variances of left hand side portfolios from 2x4x4 sorts, five factor model explained better as results of estimates are also higher. Eventually these ratios also have peculiar estimated variance from FF three factor models, hence it can be finished up that five factor model which constitutes the leverage and $wacc$ is identical on described metrics have performed systematically better than the three factors model .

Interpretation of Table 4.5:

Results for Each of the five factors regression on the other four are shown in table 4.5 which shows that the intercepts are around -0.07% per month with T-value (T=-17.13) in the $R_m - R_f$ regressions which demonstrates that -0.07% of average returns are not explained by exposure to SMB, HML, $HLMLL$ and $HWMLW$. Same is case in 2x2 sorting that intercept are around to -0.07% per month with T-value (T-14.21) but in 2x2x2x2 sorting the intercepts are around 0.01% per month with T-value (T=1.78) which shown that only 0.01% of the average retunes remained unexplained

when expose to factors of $size-B/M$, $HLMLL$ and $HWMLW$ sorted on 2x2x2x2 for joint control of $\text{size, value, lev and wacc}$.

As per the outcome of the research data analysis no one factor declared redundant which regrets the multicollenearity supported by the model addition of $leverage$ and $wacc$ with market, size and value factors have improved the mean-variance-efficient tangency of portfolio but tolerable multicollenearity exist on very small level. As almost the same description of average returns has been produced by the three different versions of factors. Therefore focuses of regressions have been concentrated on one set of factors to keep the demonstration of regression details convenient. For instance, the factor from the 2x3 sorts, FF (1993) approach has been applied .

Multivariate Regressions Regression Details

Regressions are applied to have further detailed understanding into model performance specifically intercepts and its related slopes. Regression intercepts and their significant coefficient for the all left hand side portfolio has been described in individual tables . As a main perception to view the five factor results, the regression intercepts for the five factor model from the augmented FF three factor models with $HLMLL$ and $HWMLW$ have sensitized. The Next Section Provide More Examples of Multivariate Regression Slopes that don't line-up with Uni-variate attributes .

Interpretation of Table 4.6:

Intercepts from the FF three factor regression for the $25\,size-B/M$ portfolios are shown in panel A. The portfolios of extreme small growth stock produce negative intercepts whereas large extreme growth stock generates positive intercepts. So this extreme growth stock or upper left corner of intercept matrix create a difficulty in explaining the returns for the three factor model as also evidenced by Fama and French (1993, 2012, 2014). Here the results also shows that, by itself, the lower and negative 3 factors intercepts -0.002% per month (T=-0.38) for explaining the expected returns on the $25\,size-B/M$ portfolios are sufficient to reject the three factor model. However, this problem is reduces by five factor regression on major scale as the microcap extreme growth portfolio's intercept becomes positive and intercepts for the fourth portfolio also shrink towards zero to but larger extreme growth portfolios follow same pattern, overall the tweeting pattern of the three factors extreme growth intercepts does not persists in the five factor model hence, in explaining the expected returns on the $25\,size-B/M$ portfolio returns the five factor model is considered the healthier .

Coefficients obtained from five factor model for HML , $HLMLL$ and $HWMLW$ are revealed in panel B of table 4.6. To save the space the coefficients for market and SMB are not show as according to logic market slope is always close to 1.0 and smaller stock have strongly SMB slopes as compared to SMB slopes for the big stock which are slightly negative and both results same almost in different models, so by adding different other factors they cannot represents changes in the

intercepts watched so here and later the main focus is on slopes for HML, $HLMLL$ and $HWMLW$.Results for HML show the overall significantly negative pattern of five factors slopes for both micro and mega-caps portfolios in $Low\,B/M$ quintiles. The portfolio's HML slope for microcap extreme growth stock is (-0.48, T= -4.97), and for mega cap extreme growth stock is (-0.80, T = -11.14) .

Overall results show that with increase in size (small to big) and increase in value from low to high the average returns increases. The results are in line with the evidence providing by Fama& French three-factor model (1992) which recommend that book-to-market is a valued factor and is absolutely connected to the portfolio returns intended for equity market of Pakistan. Results of $HLMLL$ and $HWMLW$ slopes reveals that portfolios are overwhelmed by microcaps whose returns acts like those having low level of leverage that grows promptly. The portfolios positive five factors loadings on $HLMLL$, and negative HWMLW absorbs portion of its three factor intercept (-0.002 T=0.38) although the five factors model improved large portion of unexplained average returns (0.003 T=0.62). Likewise, the similar results are not deployed whenever the lefts hand side assets incorporate a portfolio of small stocks with solid positive $HLMLL$ and negative $HWMLW$ Slope .

Interpretation of Table 4.7:

Intercepts from the FF three factor regression for the $25\,size-lev$ portfolios are shown in panel A of table 4.7. The portfolios of both micro and mega caps with lowest and highest leverage produce positive intercepts whereas negative intercepts has been produced by middle portfolios. Like the $25\,size-B/M$ portfolios here the results displays that, by itself, the negative 3 factors intercepts of middle portfolios for explaining the expected returns on the $25\,size-lev$ portfolios are not adequate to dismiss the three factor model and Overall . The outcomes recommend the three factor isn't probably going to have issues in applications when portfolios have solid tilts towards low or high leverage so, the $size-lev$ portfolio are not adverse for the FF three factor model. Conversely, the five factors intercept for the portfolio shows the pattern in panel b of table. The five factor regression improves the pattern in explaining the average returns as the five factors intercepts are increases but overall tweeting pattern for middle portfolios remains in five factors intercepts, however, the mega caps with highest leveraged portfolio little bit adverse for the FF five factor model and creating problem in explaining the stock returns yet it is relative unassuming to the most outrageous intercept in the other sorts. Generally, as compared to three factor model the explaining power of five augmented model improved for the $25\,size-lev$ portfolios .

Results of leverage slopes show the significantly positive relationship between highly leveraged stocks and equity returns of 25 portfolios sorted on $size-lev$. Such as microcaps with highest leverage portfolio produces positive

slopes of $HLMLL$ (1.60 %, T=8.01) so as compared to mega-caps only micro-cap show the leverage effect and brings positive increases in stock returns from low leverage to high leverage. Since the influential work of Jensen and Mackling (1976) the relationship of leverage with firm's performance has been subjected to various studies and reported mix results with positive and negative impact (Khan, 2012, NSE Handbook, 2011 and Pandey, 2006). They identified that use of leverage act like a 'twofold - edged sword' since it can either heighten the organization's prospective gains or losses (Pandey, 2006 and Khan, 2012). So our results are also following the same mix outcomes as positive for micro caps but negative for mega caps. On the other hand, mega-caps portfolios have significant negative slopes for both low and high leveraged quartiles. These results are also support the findings of Muradoglu, G., &Sivaprasad, (2008) which suggested that in explaining stock returns, leverage had played an important role and also proposed that it is not necessary that relationship must be positive. It can be deduced that this negative relationship of leverage with stock returns also due to nature of industry and the firms which effectively paid (Siva &Muradoglu 2009).

Rendering to Theoretical framework or background shows that increase in $wacc$ resulted as decrease in returns the same is endorsed by data analysis for smaller firms not for larger firms. In short, these results accommodated for five factor model for the portfolio formed on $size-lev$ just like $size-B/M$ in large part because small stocks are interlinked by the portfolios sorted on $size-lev$ whose returns work like those of firm's that contribute a considerable measure having high cost of capital but with small leverage level.

Interpretation of table 4.8:

Description of average returns in table 4.1 improves by the five factor model for the $25\,size-wacc$ portfolios presented by the FF three factor models. Panel A of table 4.8 demonstrates that microcaps with lowest $wacc$ create positive intercept whereas the negative intercepts produces by lowest $wacc$ quintile for smallest and mega caps portfolio are the problem for FF three factor models. However, as we switch to five factors model the intercepts moves towards zero and improve the overall depiction of average returns for $25\,size-wacc$ portfolios just like the portfolio sorted on $25\,size-B/M$ and $size-lev$.

Conversely, for both micro and mega caps with high $wacc$ the intercept are improved and this improvement traces to positive slope for selective leverage and cost of capital factor which improve the five factor approximation of expected returns. Data revealed that the microcap portfolio in the lowest-wacc quintile produce the three factor intercepts, (-0.002%, T= -0.37), but the portfolio's positive $HLMLL$ and $HWMLW$ *slopes (*0.57%, T=0.2.77), (0.13, T=0.72) respectively, took a five factor intercept at the level of, (0.000%, t=0.022). This intercepts are enough to accept the five factor model for explanation of average reruns for $25\,size-wacc$ portfolios as compared to 3factors model. Here five factor models improve the performance for

mega caps but Microcaps portfolios does not poses the quandary for five factor model in the $lowest-\text{wacc}$ quintiles as it shows the negative exposure to $HLMLL$ and $HWMLW$ similar to those of the firms that invest a lot having highest cost of capital but with low level of leverage but their coefficient are not sufficient to clarify their small average returns. However, results demonstrate that chirping pattern for portfolio survives in the five factors model. This trifling upgrading drops to negative slopes for leverage and $wacc$ factors which became the reason for negative exposure subsistence .

Given that the subsequent pass sort variable is $wacc$, the $HWMLW$ slopes demonstrate the projected pattern- positive for $low-\text{wacc}$ portfolios and negative for $high-\text{wacc}$ portfolios which are in-line to research data. For both micro and mega caps portfolio $HWMLW$ slope ***s***hows that the average return increases from negative to significantly positive means that with increasing cost of capital the average give positive returns which depicts that if smaller and larger firms manage their cost effectively than it bring positive increase in returns . Golden edge funds not positively utilized has the second hand effect as the increase in leverage associated with lower $HWMLW$ and hunted as lower returns. In-effective utilization of flux of funds resulted as increase in leverage resulted as increase in returns but the negative exposure to $HWMLW$ brings the significantly decrease in returns but the same microcap with highest $wacc$ shows positive exposure, differently resulted for mega caps that have positive exposure for both low and $high-\text{wacc}$ quintiles which ultimately shows the effective use of fund and good corporate governance. There is cognitive correspondence between HML and $HLMLL$ slopes and their characteristics as theory says that low cost of capital is related with value ($High-B/M$) and high cost of capital is related with (growth or $low-B/M$). Data analysis revealed that multivariate regression slopes slightly relate to uni-variate characteristics rather than factor exposure with reference to 25 size-WACC portfolios . How and why?

Interpretation of table 4.9:

Table 4.9 shows that Regression intercepts for three and five factor models and $HLMLL$ and $HWMLW$ slopes for the 32 portfolios from 2x4x4 sorts on $\text{size}, \text{lev} \text{ and } \text{wacc}$. Here five factor slopes for HML are not shown just to save the Space; these sorts of factors are interesting in explaining the lineup connection of factor's characteristics of stocks with their slopes. For small and big stocks, $HLMLL$ slopes are significantly positive for high leverage quartiles and negative for low leverage quartiles, $HWMLW$ slopes are significantly negative for low $wacc$ quartile and significantly positive for high $wacc$ quartiles. The connection between

attributes and regression slopes slants encourages derivations about the idea of the stocks in troublesome portfolios .

The main difficulty for five factor models in table 4.9 is the portfolio of small stocks in the lowest leverage and lowest $wacc$ quartiles. Its intercept, - 0.016 per month (T=-2.37) not supporting the model as a portrayal of expected returns on the $32\,size-lev-wacc$ portfolios. Low leverage as such isn't an issue for the five factor model in the outcome for small stocks. Two of the other three portfolios in the lowest leverage quartile generate positive intercepts. There is again suggestive evidence that for small stock both lowest and highest cost of capital alone is related with five factor problems. But when we look to big stocks for affirmation of five factor problem watched for small stocks, none is found. The portfolios of big stocks in the lowest leverage and lowest $wacc$ quartiles generates a positive five factor intercept, 0.005 per month (T= 1.10). Furthermore, the intercept for the four big stock portfolios in the lowest $wacc$ quartile produce positive intercepts. Consequently, if the market overrates small stock that has lowest or highest cost of capital, the issue does not extend to big stocks. To be sure, the asset pricing difficulty for big stocks is the elevated average returns of highly leveraged firms that have lowest or highest cost of capital. The FF three factor model's issue in the test on the $32\,size-lev-wacc$ portfolios are more serious. For instance, portfolios of small stocks that consolidate low leverage and low $wacc$ turnout negative intercepts in the three factor model, however in the five factor model improvement is made but negative pattern survives as the average returns of these portfolios are consumed by negative $HWMLW$ slope which reflects the almost the same results as of five factor models associated with the results of three factor model .

Overall five factors model improves the explanation of stock returns but Strong leverage and cost of capital tilts still are the troubles for the three factor model as strongly reflected in $size-lev-wacc$ sorts. As indicated by the tradeoff theory, the ideal financing blend matches with the level of money related use or financial leverage at which the advantages and expenses of obligation financing are precisely adjusted. The theory expects that a firm has an ideal capital structure in view of exchange off amongst expenses and advantages of utilizing obligation.

Conclusion

The stock returns and trading behavior regarding asset pricing and financial markets is stunt in literature even through cross sectional variances in price spectrum. Hence, in order to give more intelligible explanation of risk priced factors, the reexamination of theoretical asset pricing strands becomes necessary.

To put the research on successful track and to test the proposed asset pricing model for its significance different version adopted to construct the factors. Five factors model is used to observe the pattern in $size-B/M$, leverage and $wacc$ and the basic stress of the study also to ascertain the model which is good fit for describing average returns for which different test techniques are used to relate how well these different set of factors describe the average excess returns on the portfolio formed in different ways.

Further, Regressions are applied to have more detailed understanding into model performance specifically intercepts and its related slopes. To strengthen the outcomes, the applications of five-factor regressions are applied to get the results for the all left hand side portfolio. The detailed discussion for regression is not so remarkable at this stage however, for which its presented summary is helpful.

Finally two main significant results for all left hand side portfolios are analyzed and interpreted in the tests. First, in the given model, almost same results have been obtained for the factors constructed by adopting different sorts of version such as 2x2, 2x3, 2x2x2x2. Second but most exciting with remarkable interest, as compared to FF original three factor model the five factor model outperform resting on all ground and metrics and are also generally outperform other models. Including GRS and other measure of performance confirmed that all models performed better whereas five factor models out-performed.

Behavioral stories for the low average returns of both small and big stocks that have high cost of capital despite low level of leverage confront a genuine test. The mysterious or unsolved average returns of larger stocks that have highest cost of capital despite low level of leverage are positive. Since average returns captures lots of same common story, but this study focuses on slopes $HML, HLMLL, HWMLW$ for different set of left hand side portfolios in describing average returns but here the question arises which makes the motivation for future work that whether the factor slopes lineup with B/M , leverage and cost of capital characteristics, the frequently answer is, yet not generally yes.

Since constantly, the regression slopes are in harmony with the features which are utilized to frame left hand side portfolios but not frequently with other characteristics. There is, however by holding other explanatory variable constant the uni-variate characteristics does not in accordance with slopes of multivariate regression which estimates the trivial effect. Hence, in fact regression slope be described more carefully.

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Appendix TABLES:

Table 4.3: Descriptive Statistics for Monthly Percent Factor Returns July 1998-July 2016, 216 months

Panel A: Descriptive Statistics for Monthly Percent Factor Returns

2X3 FACTORS						2X2FACTORS					2x2x2x2 FACTORS				
	Rm-Rf	**SMB**	**HML**	**HLMLL**	**HWMLW**	**Rm-Rf**	**SMB**	**HML**	**HLMLL**	**HWMLW**	**Rm-Rf**	**SMB**	**HML**	**HLMLL**	**HWMLW**
Mean	-0.071	0.012	0.002	-0.002	0.009	-0.071	0.003	0.002	0.004	0.01	-0.071	0.001	0.002	-0.002	0.007
Std.Dev	0.095	0.177	0.078	0.035	0.052	0.095	0.046	0.061	0.057	0.055	0.095	0.054	0.061	0.026	0.035
T-Value	-10.933	1.018	0.318	-0.978	2.427	-10.933	0.837	0.551	1.072	2.676	-10.933	0.191	0.585	-1.403	2.966

	HML_S	**HML_B**	**HML_{S-B}**	**$HLMLL_S$**	**$HLMLL_B$**	**$HLMLL_{S-B}$**	**$HWMLW_S$**	**$HWMLW_B$**	**$HWMLW_{S-B}$**
2X3 FACTORS									
Mean	0.002	0.001	0.001	-0.001	-0.003	0.002	0.01	0.007	0.002
Std.Dev	0.065	0.104	0.077	0.049	0.04	0.057	0.069	0.047	0.056
t-Statistics	0.55	0.133	0.282	-0.339	-1.29	0.61	2.078	2.32	0.627
2X2FACTORS									
Mean	0.003	0.001	0.002	-0.002	0.01	-0.012	0.009	0.011	-0.002
Std.Dev	0.053	0.082	0.065	0.05	0.108	0.122	0.056	0.074	0.093
t-Statistics	0.943	0.205	0.515	-0.541	1.396	-1.45	2.41	2.148	-0.265
2x2x2x2 FACTORS									
Mean	0.014	0.006	0.008	0.003	-0.003	0.006	0.029	0.028	0.001
Std.Dev	0.212	0.326	0.259	0.142	0.148	0.15	0.196	0.149	0.208
t-Statistics	0.949	0.253	0.457	0.325	-0.324	0.626	2.15	2.732	0.068

Panel B: Correlation between Different Forms of the Similar Factor

	SMB			**HML**			**HLMLL**			**HWMLW**		
	2X3	**2X2**	**2X2X2X2**	**2X3**	**2X2**	**2X2X2X2**	**2X3**	**2X2**	**2X2X2X2**	**2X3**	**2X2**	**2X2X2X2**
2X3	1	-0.003	-0.284	1	0.946	0.943	1	0.109	0.584	1	0.906	0.727
2X2	-0.003	1	0.935	0.946	1	0.991	0.109	1	0.195	0.906	1	0.836
2X2X2X2	-0.284	0.935	1	0.943	0.991	1	0.584	0.195	1	0.727	0.836	1

Panel C: Correlation Matrix between Different Factors

	2X3 Factors					**2x2 Factors**					**2X2X2X2 Factors**				
	Rm-Rf	**SMB**	**HML**	**HLMLL**	**HWMLW**	**Rm-Rf**	**SMB**	**HML**	**HLMLL**	**HWMLW**	**Rm-Rf**	**SMB**	**HML**	**HLMLL**	**HWMLW**
Rm-Rf	1	0.489	-0.221	0.161	-0.113	1	-0.177	-0.32	0.427	-0.184	1	-0.274	-0.302	0.016	-0.096
SMB	0.489	1	0.549	-0.176	0.506	-0.177	1	0.1	-0.018	-0.295	-0.274	1	-0.086	0.197	-0.546
HML	-0.221	0.549	1	-0.434	0.738	-0.32	0.1	1	0.33	0.795	-0.302	-0.086	1	-0.153	0.474
HLMLL	0.161	-0.176	-0.434	1	-0.587	0.427	-0.018	0.33	1	0.261	0.016	0.197	-0.153	1	-0.232
HWMLW	-0.113	0.506	0.738	-0.587	1	-0.184	-0.295	0.795	0.261	1	-0.096	-0.546	0.474	-0.232	1

MKT Factor or $R_m - R_f$ is calculated by taking the difference between value weighted return on the market portfolio of all sample stocks and one monthly Treasury bill rate. At the ending of each June, Stocks are given in descending arrangement based on their market capitalization to create size-sorted variable. Stocks are allocated separately to two or three book to market (b/M), leverage (Lev) and weighted average cost of capital (WACC) sets, by means of market capitalization median break-points, Lev, WACC or the 30th and 70th percentiles. From the crossing of the *Size* and *B/M* sorts ,the *B/M* factor, *HML*, utilize the value weighted portfolios designed (2x2 = 4 or 2x3

= 6 portfolios), and the leverage and weighted average cost of capital factors, $HLMLL$ and $HWMLW$, uses four or six value weighted portfolios from the crossing of the *Size* and *Lev* or *WACC* sorts.*HML*, $HLMLL$ and $HWMLW$ utilizes the crossings points of the Size, B/M, Lev, and WACC sorts in the third tablet and creates (2x2x2x2=16 portfolios) Small and big stock portfolios basically used to construct the value, leverage and cost of capital factors. *HMLB* is the average return on the portfolio(s) of big high *B/M* stocks minus the average return on the portfolio(s) of big low *B/M* stocks, identical to that *HMLS* is, however for small stocks portfolios, *HML* is the average of *HMLS* and *HMLB*, and *HMLS-B* is the difference between them. $HLMLL_S$, $HLMLLB$, $HLMLL$, $HLMLL_{S\text{-}B}$, $HWMLW_S$, $HWMLW_B$, $HWMLW$, $HWMLW_{S\text{-}B}$, are demarcated in the similar mode but instead of B/M uses high and low Lev or WACC . In the 2x2x2x2 sorts, average return on the 8 portfolios of small stocks minus the average return on the 8 portfolios of big stocks defined the size factor. *SMB has 3* different versions in the isolated 2x3*Size-B/M*, Size-*Lev*, and *Size*-WACC *sorts*, one for every 2x3 sort, and *SMB* is the average of the three. Likewise, the *SMB* in the separate 2x2 sorts is well-defined. Panel A illustrates the descriptive statistics (mean, standard deviation and t-value) for the factors returns. From different sorts correlation of the same factors shows in panel B and for each set of factors panel C shows the correlation .

Table 4.6: Regressions for 25 Value-Weighted, Size-B/M Portfolios (July 1998 to July 2016, 216 Months)

B/M	LOW	2	3	4	HIGH	LOW	2	3	4	HIGH	LOW	2	3	4	HIGH
Panel A: Three-Factor Intercepts: Rm-Rf, SMB, HML															
	(α)					*T(α)*					*P(α)*				
SMALL	-0.002	0.000	0.004	0.003	0.010	-0.380	0.044	0.685	0.605	1.492	0.705	0.965	0.494	0.546	0.137
2	0.000	0.000	-0.002	0.006	-0.001	-0.036	-0.006	-0.647	1.266	-0.159	0.971	0.996	0.518	0.207	0.874
3	-0.004	0.000	-0.002	-0.004	-0.004	-0.974	0.134	-0.379	-0.902	-1.098	0.331	0.894	0.705	0.368	0.274
4	-0.004	-0.003	-0.003	-0.002	-0.003	-1.073	-0.865	-0.717	-0.356	-0.501	0.284	0.388	0.474	0.722	0.617
BIG	0.002	0.003	0.006	-0.003	0.003	0.424	0.475	1.440	-0.636	0.870	0.672	0.635	0.151	0.525	0.385
Panel B: Five-factor Intercept: Rm-Rf, SMB, HML, HLMLL, HWMLW															
	(α)					*T(α)*					*P(α)*				
SMALL	0.003	0.004	0.010	0.005	0.011	0.623	0.768	1.901	1.201	1.866	0.534	0.443	0.059	0.231	0.063
2	0.006	-0.001	-0.003	0.008	0.002	1.282	-0.323	-1.047	1.746	0.571	0.201	0.747	0.296	0.082	0.569
3	0.001	0.002	-0.008	-0.009	-0.006	0.200	0.543	-2.268	-2.390	-1.719	0.841	0.588	0.024	0.018	0.087
4	-0.002	0.000	-0.008	-0.009	-0.001	-0.577	-0.011	-2.313	-2.012	-0.219	0.564	0.992	0.022	0.046	0.827
BIG	0.002	0.001	0.002	-0.005	0.000	0.560	0.118	0.495	-1.074	-0.065	0.576	0.906	0.621	0.284	0.948
Panel B: Five-factor coefficients :Rm-Rf, SMB, HML, HLMLL, HWMLW															
	(β)HML					*P(HML)*					*P(HML)*				
SMALL	-0.480	-0.270	0.110	0.320	0.920	-4.970	-2.554	1.137	3.941	7.855	0.000	0.011	0.257	0.000	0.000
2	-0.680	-0.020	-0.040	0.260	1.150	-7.103	-0.253	-0.609	2.930	14.663	0.000	0.801	0.543	0.004	0.000
3	-0.140	-0.280	0.060	0.450	1.090	-1.832	-4.435	0.928	6.411	15.858	0.068	0.000	0.354	0.000	0.000
4	-0.670	-0.330	-0.490	-0.260	1.320	-8.805	-4.901	-7.493	-2.937	11.249	0.000	0.000	0.000	0.004	0.000
BIG	-0.800	-0.550	-0.780	-0.030	0.150	-11.142	-4.920	-11.034	-0.289	2.235	0.000	0.000	0.000	0.773	0.027
	(β)LEV					*T(LEV)*					*P(LEV)*				

SMALL	0.480	0.010	-0.030	0.170	1.320	2.654	0.034	-0.145	1.094	6.088	0.009	0.973	0.885	0.275	0.000
2	0.340	-0.070	0.080	-0.310	-0.090	1.918	-0.493	0.652	-1.883	-0.619	0.057	0.623	0.515	0.061	0.537
3	-0.050	-0.140	-0.140	-0.110	-0.210	-0.317	-1.167	-1.110	-0.844	-1.625	0.752	0.244	0.268	0.400	0.106
4	0.360	0.100	-0.340	-0.350	-0.500	2.563	0.838	-2.818	-2.149	-2.274	0.011	0.403	0.005	0.033	0.024
BIG	-0.020	0.540	-0.500	-0.670	-0.370	-0.125	2.621	-3.748	-3.970	-2.924	0.901	0.009	0.000	0.000	0.004
	(β)WACC					*T(WACC)*					*P(WACC)*				
SMALL	-0.560	-0.510	-0.800	-0.290	0.070	-3.452	-2.889	-4.806	-2.139	0.380	0.001	0.004	0.000	0.034	0.705
2	-0.770	0.160	0.190	-0.360	-0.400	-4.824	1.151	1.814	-2.447	-3.064	0.000	0.251	0.071	0.015	0.003
3	-0.640	-0.210	0.830	0.650	0.240	-4.912	-1.927	7.087	5.493	2.094	0.000	0.055	0.000	0.000	0.038
4	-0.180	-0.360	0.590	0.870	-0.320	-1.392	-3.254	5.381	5.942	-1.637	0.165	0.001	0.000	0.000	0.103
BIG	-0.080	0.380	0.400	0.110	0.370	-0.625	2.032	3.323	0.736	3.217	0.532	0.043	0.001	0.463	0.002

Regressions for 25 value weight $size - B/M$ portfolios are given in table 4.10 for the time period of 216 months (July-1998July-2016). Sorting is done at the finishing of June every year a for which by using PSX market capitalization breakpoints ,stock are assigned to five size groups from smalls stock to big stocks. Again each size group is subdivided independently into further 5 B/M sub-group (from Low B/M to High B/M) using PSX cutoff points . $25\,size - B/M$ Portfolios are created by these intersections of the two sorts. For running 25 set of regression the left hand side variable is monthly average returns on $25\,size - B/M$ portfolios. The independent variable or right hand side variables are 2x3 versions' factors. For example MKT factor is the monthly returns of market in excess of one month t bill rate $MKT = R_m - R_f$, similarly Size factor is SMB, value factor is HML , leverage factor is $HLMLL$, WACC factor is $HWMLW$. These factors are created by means of separate 2x3 sorts on size and each of B/M , lev and wacc . Three factors intercept formed by the MKT , *SMB and HML* are shown in panel A of Table 4.6 and panel B illustrates the five factor intercept and slopes of HML , $HLMLL$, $HWMLW$ and also T-statistics for these slopes . The Three and Five Factor Regression Equations are:

$$R_{pt} - R_{ft} = \alpha + \beta_1 (R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_t$$

$$R_{pt} - R_{ft} = \alpha + \beta_1 (R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 HLMLL_t + \beta_5 HWMLW_t + \varepsilon_t$$

Table 4.7: Regressions for 25 Value-Weighted, Size-Lev Portfolios (July 1998to July 2016-216 Months)

Lev	LOW	2	3	4	HIGH	LOW	2	3	4	HIGH	LOW	2	3	4	HIGH
Panel A: Three-Factor Intercepts: Rm-Rf, SMB, HML															
	(α)					*T(α)*					*P(α)*				
SMALL	0.001	0.007	0.002	0.003	0.002	0.155	1.496	0.332	0.464	0.345	0.877	0.136	0.740	0.643	0.731
2	0.002	0.005	-0.002	0.003	-0.005	0.315	1.243	-0.420	0.604	-1.000	0.753	0.215	0.675	0.547	0.319

3	-0.003	-0.001	-0.002	-0.004	-0.003	-0.693	-0.286	-0.666	-1.123	-0.839	0.489	0.775	0.506	0.263	0.402
4	0.001	-0.003	-0.003	-0.008	-0.003	0.366	-0.908	-0.841	-1.477	-0.655	0.715	0.365	0.401	0.141	0.513
BIG	0.003	0.002	0.005	0.002	0.000	0.688	0.384	1.518	0.306	-0.013	0.492	0.702	0.131	0.760	0.990
Panel B: Five-Factor Intercept: Rm-Rf, SMB, HML, HLMLL, HWMLW															
	(a)					*T(α)*					*P(α)*				
SMALL	0.003	0.009	0.007	0.008	0.006	0.522	2.024	1.445	1.523	1.153	0.602	0.044	0.150	0.129	0.250
2	-0.002	0.009	-0.003	0.007	0.001	-0.495	2.049	-0.660	1.600	0.309	0.621	0.042	0.510	0.111	0.758
3	-0.009	-0.002	-0.003	-0.004	-0.002	-2.450	-0.588	-0.870	-1.251	-0.573	0.015	0.557	0.385	0.213	0.567
4	-0.003	-0.009	-0.003	-0.006	-0.001	-0.802	-2.448	-0.884	-1.095	-0.235	0.424	0.015	0.378	0.275	0.815
BIG	-0.001	-0.005	0.006	0.001	-0.006	-0.152	-1.432	2.059	0.112	-1.039	0.879	0.154	0.041	0.911	0.300
Panel B: Five-Factor Coefficients: Rm-Rf, SMB, HML, HLMLL, HWMLW															
	(ß)HML					*T(HML)*					*P(HML)*				
SMALL	-0.350	0.190	0.500	-0.300	0.550	-3.477	2.120	5.313	-3.113	5.095	0.001	0.035	0.000	0.002	0.000
2	-0.090	0.020	-0.100	0.470	0.370	-0.916	0.241	-1.266	5.385	4.690	0.361	0.810	0.207	0.000	0.000
3	-0.040	0.140	0.330	0.630	0.130	-0.586	2.113	4.981	9.474	1.792	0.558	0.036	0.000	0.000	0.075
4	-0.120	0.180	-0.430	0.470	-0.500	-1.856	2.640	-6.268	4.460	-6.577	0.065	0.009	0.000	0.000	0.000
BIG	-0.430	0.010	-0.500	-0.910	-0.230	-6.991	0.178	-8.332	-7.686	-2.113	0.000	0.859	0.000	0.000	0.036
	(ß)LEV					*T(LEV)*					*P(LEV)*				
SMALL	-0.290	-0.130	0.080	0.680	1.600	-1.521	-0.763	0.460	3.777	8.013	0.130	0.446	0.646	0.000	0.000
2	-0.480	-0.130	-0.180	-0.150	0.910	-2.713	-0.866	-1.283	-0.949	6.202	0.007	0.387	0.201	0.344	0.000
3	-0.260	-0.140	-0.200	-0.210	0.220	-1.919	-1.115	-1.607	-1.702	1.613	0.056	0.266	0.110	0.090	0.108
4	-0.320	-0.170	-0.460	-0.260	0.460	-2.587	-1.328	-3.588	-1.309	3.208	0.010	0.186	0.000	0.192	0.002
BIG	-0.700	-0.230	-0.410	0.810	-0.560	-6.086	-1.733	-3.677	3.689	-2.750	0.000	0.085	0.000	0.000	0.007
	(ß)WACC					*T(WACC)*					*P(WACC)*				
SMALL	-0.320	-0.360	-0.680	-0.520	-0.200	-1.843	-2.395	-4.303	-3.194	-1.080	0.067	0.018	0.000	0.002	0.281
2	0.420	-0.470	0.090	-0.610	-0.600	2.627	-3.440	0.691	-4.181	-4.567	0.009	0.001	0.491	0.000	0.000
3	0.770	0.110	0.050	0.020	-0.070	6.232	0.966	0.485	0.197	-0.614	0.000	0.335	0.628	0.844	0.540
4	0.460	0.620	-0.080	-0.300	-0.120	4.152	5.541	-0.695	-1.704	-0.944	0.000	0.000	0.488	0.090	0.346
BIG	0.230	0.860	-0.300	0.330	0.630	2.248	7.078	-3.018	1.663	3.443	0.026	0.000	0.003	0.098	0.001

Regressions for 25 value weight $size-lev$ portfolios are given in table 4.7for the time period 216 months (July-1998 to July-2016). Sorting is done at the end of June each year, for which by using PSX market capitalization breakpoints ,stock are assigned to five size groups from smalls stock to big stocks. Again each size group is subdivided independently into further 5 leverage subgroup (from low leverage to high leverage) utilizing PSX split points. The crossing points of these two sorts create $25\,size-lev$ portfolios. In favor of running 25 set of regression the left hand side variable is monthly average returns on $25\,size-lev$ portfolios. The independent variable or right hand side variables are 2x3 versions' factors. For example MKT is the monthly returns of market in excess of one month t-bill rate $MKT = R_m - R_f$, similarly Size factor is SMB, value factor is HML, leverage factor is $HLMLL$, $wacc$ factor is $HWMLW$. These factors are

developed by utilizing independent 2x3 sorts on size and each of $B/M-lev$, $wacc$. Three factors intercept formed by the MKT , SMB and HML are appeared in panel A of Table 4.7 and panel B illustrates the five factor intercept and slopes of $HML, HLMLL, HWMLW$ and also t-statistics for these slopes . The Three and Five Factor Regression Equations are:

$$R_{pt} - R_{ft} = \alpha + \beta_1 (R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_t$$

$$R_{pt} - R_{ft} = \alpha + \beta_1 (R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 HLMLL_t + \beta_5 HWMLW_t + \varepsilon_t$$

Table 4.8: Regressions for 25 Value-Weighted, Size-Wacc Portfolios (July 1998 to July 2016-216 Months)

WACC	LOW	2	3	4	HIGH	LOW	2	3	4	HIGH	LOW	2	3	4	HIGH
Panel A: Three-Factor Intercepts: Rm-Rf, SMB, HML															
	(a)					*T(a)*					*P(a)*				
SMALL	0.005	-0.006	0.001	0.001	0.013	0.859	-0.978	0.193	0.136	2.267	0.392	0.329	0.847	0.892	0.024
2	-0.004	-0.004	0.003	0.003	0.004	-0.934	-1.010	0.602	0.650	0.841	0.351	0.314	0.548	0.517	0.402
3	-0.007	-0.008	-0.004	0.001	0.006	-1.726	-2.053	-1.077	0.339	1.681	0.086	0.041	0.283	0.735	0.094
4	-0.003	-0.010	-0.008	0.002	0.003	-0.744	-2.254	-1.800	0.282	0.939	0.458	0.025	0.073	0.778	0.349
BIG	-0.002	-0.004	0.001	0.004	0.012	-0.372	-1.100	0.082	1.173	3.257	0.710	0.273	0.935	0.242	0.001
Panel B: Five-Factor Intercept: Rm-Rf, SMB, HML, HLMLL, HWMLW															
	(a)					*T(a)*					*P(a)*				
SMALL	0.012	-0.002	0.005	0.006	0.013	2.240	-0.418	0.848	1.212	2.321	0.026	0.677	0.398	0.227	0.021
2	-0.001	-0.001	0.013	0.001	-0.001	-0.155	-0.288	2.809	0.240	-0.216	0.877	0.774	0.005	0.811	0.829
3	-0.004	-0.004	-0.009	-0.004	0.000	-0.928	-0.923	-2.524	-1.340	0.137	0.355	0.357	0.012	0.182	0.891
4	0.000	-0.005	-0.003	-0.011	-0.002	0.028	-1.183	-0.703	-2.259	-0.768	0.978	0.238	0.483	0.025	0.443
BIG	-0.002	-0.004	-0.008	0.004	0.006	-0.381	-1.113	-1.402	1.016	1.903	0.704	0.267	0.162	0.311	0.058
Panel C: Five-Factor Coefficients: Rm-Rf, SMB, HML, HLMLL, HWMLW															
	(β)HML					*T(HML)*					*P(HML)*				
SMALL	-0.196	0.339	0.087	0.030	0.322	-1.957	3.122	0.810	0.321	3.039	0.052	0.002	0.419	0.748	0.003
2	-0.228	0.095	0.252	0.661	-0.100	-3.141	1.193	2.770	7.819	-1.180	0.002	0.234	0.006	0.000	0.239
3	0.204	0.360	0.336	0.339	-0.054	2.750	4.784	4.858	5.558	-0.913	0.007	0.000	0.000	0.000	0.362
4	-0.763	0.108	0.284	0.034	-0.073	-11.521	1.297	3.515	0.370	-1.216	0.000	0.196	0.001	0.712	0.225
BIG	-0.610	-0.446	-0.144	-0.094	-0.625	-5.467	-6.034	-1.359	-1.255	-10.441	0.000	0.000	0.176	0.211	0.000
	(β)LEV					*T(LEV)*					*P(LEV)*				
SMALL	-0.012	0.603	0.115	0.410	0.844	-0.066	2.985	0.575	2.350	4.280	0.948	0.003	0.566	0.020	0.000
2	0.262	0.085	-0.052	-0.188	-0.172	1.944	0.570	-0.308	-1.193	-1.089	0.053	0.569	0.758	0.234	0.278
3	0.028	0.153	-0.279	-0.249	-0.247	0.205	1.092	-2.174	-2.197	-2.254	0.838	0.276	0.031	0.029	0.025
4	-0.041	0.232	-0.341	-0.216	-0.369	-0.336	1.495	-2.270	-1.270	-3.323	0.737	0.136	0.024	0.206	0.001

BIG	0.575	-0.642	-0.821	0.045	-0.302	2.773	-4.678	-4.173	0.323	-2.714	0.006	0.000	0.000	0.747	0.007
	(β)WACC					*T(WACC)*					*P(WACC)*				
SMALL	-0.900	-0.290	-0.448	-0.584	0.168	-5.363	-1.592	-2.486	-3.713	0.944	0.000	0.113	0.014	0.000	0.346
2	-0.330	-0.367	-1.296	0.186	0.582	-2.719	-2.739	-8.512	1.312	4.081	0.007	0.007	0.000	0.191	0.000
3	-0.392	-0.590	0.569	0.652	0.655	-3.150	-4.676	4.913	6.372	6.616	0.002	0.000	0.000	0.000	0.000
4	-0.351	-0.614	-0.697	1.565	0.673	-3.158	-4.380	-5.140	10.175	6.717	0.002	0.000	0.000	0.000	0.000
BIG	0.134	-0.144	0.885	0.071	0.712	0.718	-1.166	4.983	0.564	7.098	0.474	0.245	0.000	0.573	0.000

Regressions for 25 value weight $size-wacc$ portfolios are given in table 4.8 for the time period 216 months (July-1998 to July-2016). Sorting is done toward the finish of June every year, for which by using PSX market capitalization breakpoints, stock are assigned to five size groups from smalls stock to big stocks. Again each size group is subdivided independently into further 5 $wacc$ sub-groups (from Low $wacc$ to High $wacc$) utilizing PSX split points. The convergences of these two sorts create $25\,size-wacc$ portfolios. For running 25 set of regression the left hand side variable is monthly average returns on $25\,size-wacc$ portfolios. The independent variable or right hand side variables are 2x3 versions' factors. For example MKT is the monthly returns of market in excess of one month t -bill, rate $MKT = R_m - R_f$, similarly Size factor is SMB , value factor is HML , leverage factor is $HLMLL$, $wacc$ factor is $HWMLW$. These factors are build up by utilizing independent 2x3 sorts on size and every of B/M , lev , $wacc$. Three factors intercept formed by the MKT , SMB and HML are shown in panel A of Table 4.8 and panel B illustrates the five factor intercept and slopes of HML , $HLMLL$, $HWMLW$ and also T-statistics for these slopes .The Three and Five Factor Regression Equations are:

$$R_{pt} - R_{ft} = \alpha + \beta_1 (R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_t$$

$$R_{pt} - R_{ft} = \alpha + \beta_1 (R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 HLMLL_t + \beta_5 HWMLW_t + \varepsilon_t$$

Table 4.9: Regressions for 32 Value-Weighted, SIZE-LEV-WACC Portfolios (July 1998 to July 2016, 216 Months)

					SMALL												BIG						
Lev	LOW	2	3	HIGH	LOW	2	3	HIGH	LOW	2	3	HIGH	LOW	2	3	HIGH	LOW	2	3	HIGH	LOW	2	3	HIGH
Panel A: Three-Factor Intercept: Rm-Rf, SMB, HML																								
	(α)				*(T)*				*P(α)*				*(α)*				*(T)*				*P(α)*			
LOW WACC	-0.007	-0.005	0.003	0.002	-1.498	-1.193	0.522	0.323	0.136	0.234	0.602	0.747	0.001	-0.008	-0.007	0.001	0.306	-2.191	-1.354	0.082	0.760	0.030	0.177	0.935
2	0.003	0.002	-0.007	-0.002	0.564	0.471	-1.487	-0.302	0.573	0.638	0.138	0.763	0.000	-0.007	-0.010	-0.006	0.042	-1.666	-1.865	-1.349	0.967	0.097	0.064	0.179
3	0.002	0.003	-0.002	-0.005	0.377	0.715	-0.267	-0.988	0.706	0.475	0.790	0.324	0.005	0.003	0.003	-0.007	0.878	0.673	0.685	-1.588	0.381	0.502	0.494	0.114
HIGH WACC	0.011	0.005	0.005	0.008	1.993	1.047	1.124	1.171	0.048	0.296	0.262	0.243	0.004	0.004	0.007	0.006	0.896	0.972	1.769	1.024	0.372	0.332	0.078	0.307
Panel B: Five-Factor Intercept and Coefficients: Rm-Rf, SMB, HML, HLMLL, HWMLW																								
	(α)				*(T)*				*P(α)*				*(α)*				*(T)*				*P(α)*			
LOW WACC	-0.006	-0.002	0.012	0.009	-1.226	-0.439	2.295	1.599	0.222	0.661	0.023	0.111	0.005	-0.005	-0.001	0.003	1.097	-1.254	-0.206	0.410	0.274	0.211	0.837	0.682
2	0.008	0.006	-0.006	-0.002	1.386	1.202	-1.215	-0.265	0.167	0.231	0.226	0.791	-0.010	-0.004	-0.009	-0.006	-1.938	-0.986	-1.718	-1.462	0.054	0.325	0.087	0.145
3	-0.002	0.005	0.005	0.001	-0.511	1.360	0.904	0.299	0.610	0.175	0.367	0.765	-0.005	-0.002	0.001	-0.007	-1.024	-0.555	0.102	-1.516	0.307	0.580	0.919	0.131
HIGH WACC	0.005	0.000	0.002	0.013	0.917	-0.084	0.319	2.068	0.360	0.933	0.750	0.040	-0.003	0.003	0.005	-0.001	-0.844	0.737	1.298	-0.199	0.400	0.462	0.196	0.843
	(β)LEV				*T(β)*				*P(LEV)*				*(β)LEV*				*T(β)*				*P(LEV)*			

LOW WACC	-0.309	-0.263	-0.060	0.910	-1.870	-1.592	-0.328	4.544	0.063	0.113	0.743	0.000	-0.161	-0.587	-0.156	1.376	-1.021	-4.433	-0.900	5.299	0.308	0.000	0.369	0.000
2	-0.371	-0.109	0.148	1.230	-1.850	-0.616	0.800	5.471	0.066	0.539	0.425	0.000	-0.296	-0.152	-0.651	0.323	-1.668	-1.024	-3.298	2.126	0.097	0.307	0.001	0.035
3	-0.527	-0.456	-0.142	0.748	-3.367	-3.427	-0.746	4.601	0.001	0.001	0.457	0.000	-0.630	-0.485	-0.702	0.106	-3.644	-3.860	-4.366	0.655	0.000	0.000	0.000	0.513
HIGH WACC	-0.306	-0.107	0.363	1.346	-1.602	-0.708	2.127	5.902	0.111	0.480	0.035	0.000	-0.479	0.083	-0.241	-0.386	-3.922	0.593	-1.627	-2.065	0.000	0.554	0.105	0.040
	(β)WACC				*T(WACC)*				*P(WACC)*				*(β)WACC*				*T(WACC)*				*P(WACC)*			
LOW WACC	-0.209	-0.503	-1.153	-0.699	-1.402	-3.374	-6.962	-3.866	0.162	0.001	0.000	0.000	-0.484	-0.616	-0.778	-0.007	-3.411	-5.155	-4.981	-0.028	0.001	0.000	0.000	0.978
2	-0.674	-0.494	-0.125	0.225	-3.728	-3.083	-0.748	1.111	0.000	0.002	0.455	0.268	1.208	-0.389	-0.238	0.147	7.547	-2.895	-1.335	1.073	0.000	0.004	0.184	0.285
3	0.400	-0.406	-0.842	-0.678	2.828	-3.386	-4.897	-4.620	0.005	0.001	0.000	0.000	1.175	0.486	0.206	0.008	7.541	4.283	1.419	0.057	0.000	0.000	0.157	0.955
HIGH WACC	0.745	0.614	0.575	-0.348	4.324	4.521	3.735	-1.692	0.000	0.000	0.000	0.092	0.744	0.122	0.190	0.792	6.750	0.969	1.422	4.695	0.000	0.334	0.157	0.000

Table shows the results of five factor regressions for $32\ size-lev-wacc$ portfolios for the time period of 216 months (july-1998 july-2016). Sorting is done at the end of June each year, for which by utilizing PSX market capitalization cutoff points, stock are assigned to two size groups (smalls stock and big stocks). Again each size group is subdivided independently into further 4 leverage subgroup (from $Low-lev$ to $High-lev$) and 4 lev subgroup ($Low-wacc$ to $High-wacc$) using PSX lev and $wacc$ cutoff points for small and big stocks.

The intersections of these three sorts produce $32\ size-lev-wacc$ portfolios. For running 32 set of regression the left hand side variable is monthly average returns on $32\ size-lev-wacc$ portfolios. The independent variable or right hand side variables are 2x3 versions' factors. For example MKT is the monthly returns of market in excess of one month t bill rate $MKT=R_m-R_f$, similarly Size factor is SMB , value factor is HML , leverage factor is $HLMLL$, $wacc$ factor is $HWMLW$. These factors are created by utilizing independent 2x3 sorts on size and every of B/M, lev and wac . Three factors intercept produced by the MKT , SMB and HML are exposed in panel A of table 4.9 and panel B of table 4.9 illustrates the five factor intercept and slopes of $HML, HLMLL, HWMLW$ and also T-statistics for these slopes .The Three and Five Factor Regression Equations are:$Rpt - Rft = \alpha + \beta 1\ (Rmt - Rft) + \beta 2SMBt + \beta 3HMLt + \varepsilon t Rpt - Rft = \alpha + \beta 1\ (Rmt - Rft) + \beta 2SMBt + \beta 3HMLt + \beta 4\text{HLMLL}t + \beta 5\text{HWMLW}t + \varepsilon t$