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Liquidity and Asset Pricing Model: Evidence from Pakistan Equity Market

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Abstract:

The theme of this study is to examine the role of liquidity via approaching various asset pricing models in the Pakistan equity market. The liquidity of the firm is measured by the share turnover. This study follows Fama and French (1993) three factors approach to construct three factors i.e. size, value and liquidity. The sample size consists of 298 firms from non-financial industries listed on PSX and considers monthly data from 2001 to 2015 for empirical investigation. By testing four various asset pricing models, this study concludes that four factor asset pricing models better describe the variations in portfolios. The result of the study confirms the significant contribution of a liquidity factor in given asset pricing models. Therefore, the academicians and practitioners both should consider the liquidity as a significant indicator for estimating the security prices in the Pakistan equity market.

Keywords: *Size, Value Premium, Liquidity, Four Factor Model*

1. Introduction

The objective of the study is to test the contribution of the liquidity premium in intersection to size and value premium in Pakistan Stock Exchange. Amihud and Mendelson (1986) were the earliest to document the contribution of liquidity proxy by the bid-ask spread in the asset pricing model. Their study uses Fama-MacBeth (1973) portfolio formation techniques and concludes the positive link between portfolio returns and liquidity. The study further recommends that an investor holding stocks with longer period than shorter period will ask for low premium. This study considers the context of Fama-French three-factor model enlarged by the liquidity factor. Bangash, Khan, and Jabeen (2018) argued that Pakistan Stock Exchange is the most popular equity market of Asia, although it is ignored by researchers due to lack of easy access to the data. Their study considers liquidity factor in amalgamation to momentum factor and concluded that the positive relationship between momentum factor and stock returns is due to less liquid stocks. This study gets motivation from Bangash et al. (2018) study by considering the significance of liquidity factor in the Pakistan equity market. The contribution of this study is that it considers liquidity premium in amalgamation to size and value factors instead of momentum factor in Pakistan Stock Exchange. This study constructs 18

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portfolios from juncture of two size (50:50), three B/M ratios (30:40:30) and three liquidity (30:40:30) group (detail given in the methodology section). The benefit of the three mimicking portfolio is that it controls the effects of other two respective factors. For instance, in constructions of SMB mimicking portfolios each element of small size portfolio has a similar big size portfolio complement i.e. S/L/V vs B/L/V. Keene and Peterson (2007), examined the aspects of liquidity in asset pricing models by adding it to Carhart (1997) four-factor models and concluded that it partially explained the stock returns. Although by the addition of the liquidity factor, the overall explanatory power of stock returns increased.

The Capital Asset Pricing Model (CAPM) by Sharpe (1964) is routinely used to explain the association among risk and returns. It bases on the efficient market hypothesis (EMH) i.e. there is no transaction cost; no constraint on investment; transparency; rational behavior of investors and symmetric information but several studies critique deficiencies in CAPM. In 1970‟s EMH was tested by using CAPM to find the required rate of returns, but it results in many variations that was explained in the theory (Fama, 1970). Silver (2011) documents that a financial market anomaly means a condition in which a stock or portfolio performance variant from the efficient market hypothesis. This critique motivates researchers to consider other risk factors. The large number of empirical studies shows that portfolio or stock returns can be highly explained by the amalgamation of other risk factors instead of only single factor as explained by CAPM. This inconsistency of empirical evidence from CAPM is known as CAPM anomalies. Literature shows that there is a large number of risk factors which contribute towards average returns. It includes price to earnings ratio by Basu (1977), book/market ratio by Stattman (1980); Reingaum (1981), size by Banz (1981); Keim (1983), liquidity by Amihud and Mendelson (1986), leverage by Bhandari (1988), and momentum effect by Jagadeesh and Titman (1993). The recent edition in the context of asset pricing is two more factors i.e. investment and operating profit by Fama and French (2015) i.e. the five factor model. These models assume that there is no transaction cost, means equity market is perfectly liquid. Therefore, the impact of liquidity is ignored in these studies. Holden, Jacobsen, and Subrahmanyam (2014) document a detailed study on the significance of liquidity in measuring share prices.

Literature regarding the consideration of liquidity in the asset pricing model is comparatively recent. Chan and Faff (2003) conducted a study in Australian equity market where they tested the inclusion of liquidity in asset pricing model. Their study shows that liquidity has a significance impact in explaining the asset pricing in Australia equity market by controlling other four factors like beta, size, book/market ratio and momentum. Pastor and Stambaugh (2003) augment the liquidity factor with the Fama and French (1993) three-factor model and conclude that there is highly significant support for the liquidity factor, while explaining the asset pricing. Machado and De Medeiros (2012) found the presence of liquidity premium in Brazil equity market and report that the presence of liquidity is not limited to January and various periods under study. But both capital asset pricing model and Fama and French (1993) three factor model are failed to describe the significant role of liquidity premium. There are various proxies used to measure the liquidity: bid-ask spread (Amihud & Mendelson, 1986), trading volume (Brennan et al., 1998), turnover ratio (Chan & Faff, 2005), trading volume and coefficient of variation of turnover ratio (Chordia et al., 2001), illiquidity ratio (Amihud, 2002), liquidity ratio (Pastor & Stambaugh, 2003) and liquidity ratio (Liu, 2006).

This study considers stock turnover as proxy for the measurement of stock liquidity (Chan & Faff, 2005) and uses time series version to explore the contribution of liquidity once adjusting the firm size and value risk factors. Recent literature suggests that liquidity plays significant role in an emerging equity markets as a comparison to develop equity market, where both investors and stocks are limited and result in low trading volume. The past literature empirically evidences mix and irregularity in results. It reports that liquidity in market is sometimes high and sometimes low. Therefore, investment in stocks is risky for investors when its liquidity is low in time it is needed. Similarly, Hasbrouck and Seppi (2001) argue that liquidity of stocks is risky, as it differs over time both for the whole market and individual share prices. Thus, investors consider the holding period of net stock returns (difference of gross returns and transaction cost), since the transaction cost of illiquid stocks is high, therefore it is required to provide more gross returns than liquid stocks.

The important significance of this study in Pakistan is that to the best of our knowledge, this is the first study to explore the contribution of liquidity, specifically

in the context of Fama and French (1993) three factors model in course of mimicking portfolios utilizing the data from Pakistani markets. The result of this study suggest that liquidity factor plays significant role in explaining asset pricing returns in Pakistan equity market by controlling Fama and French three factors. The result shows that illiquid portfolios have positive and highly liquid portfolios have negative coefficient to the liquidity factor (Lam & Tam, 2011). This study also tests four various asset pricing model given below (4), (5), (6) and (7) and conclude that the four-factor model (7) better explain variation in asset pricing.

The scheme of this study is arranged as follow. Second section comprises of literature review, third section consists of data source, sample size, variables description and computation, fourth section discusses the asset pricing models used, fifth section discusses empirical results and last section discusses the conclusion and recommendations of this study.

2. Literature Review

Bali, Engle, and Murray (2016) define liquidity as converting shares/stocks easily into cash. The stocks that are quickly exchangeable known as highly liquid stocks and stocks that are hardly exchangeable are known as low liquid or illiquid stocks. The determination of variation in required rate of stock returns in relation to liquidity has been extensively acknowledged in financial literature. There are various measures used for the proxy of the liquidity to examine whether illiquid stocks outperform the liquid stocks.

2.1 Liquidity and Asset Pricing Theory

Amihud and Mendelson (1986), who first documented the contribution of illiquidity in the asset pricing theory. This study used bid-ask spreads as an instrument to measure the liquidity factor and conclude empirically the existence of liquidity premium. Amihud (2002), examines the affiliation among liquidity and required stock returns by means of time series model unlike cross-sectional, as in previous study. Their study result in inverse relationship among liquidity and variation in shares returns in presence of company market beta, size and momentum. Datar et al. (1998), measure the liquidity by means of share turnover and recommends the significant role of liquidity in explaining the variation in asset prices. Its result persists after controlling the firm beta, size and value premium by

using Fama and MacBeth (1973) cross-sectional returns. Further, this study reveals that the effect of liquidity exists all over the year but not only limited to the month of January. Miralles and Miralles (2006) conducted a study in Spain equity market for the period of 1994 to 2002 to examine an illiquidity risk factor. Their study constructs a mimicking portfolio for liquidity in accumulation to Fama and French (1993) three factors i.e. firm beta, size and book/market ratio. They augment the liquidity variable in CAPM and Fama and French (1993) three factors model. Further, their study concludes that illiquidity significantly contributes in explaining variation in stock returns. Claessens and Dasgupta (1995), conducted a study in twenty emerging equity markets for the period of 1986 to 1993. Their study argues that the liquidity plays a significant role in explaining deviation in stock returns in a various market. Liang and Wei (2012), conducted a cross-sectional study among 21 developed equity markets while considering the financial crisis all over the globe and verified that liquidity in market is the actual factor of market risk in globe. Their study report that in 11 developed equity market, local liquidity risk explains the stock returns even after controlling the three F and F risk factors. Further it is also reported that those countries which are more sensitive to the global liquidity risk are outperforming within the country and across the globe. Lam and Tam (2011), conducted a study in Hong Kong where they examined the role of liquidity. Their paper finds the existence of liquidity four factors model augmented by Fama and French (1993) three factors model that is market premium, size premium and value premium. While the momentum factor isn‟t contributing towards the explanation in stock prices. Further, their study also finds the robust result to seasonality and conditional market. Keene and Peterson (2007) analyzed affiliation among liquidity and stock prices while adjusting market premium, size premium, book/market ratio and momentum. Their study results in significant contribution of liquidity in explaining variation in stock returns. Karolyi et al. (2012) test the contribution of liquidity across the various countries by collecting the data from 40 emerging and developed equity markets. Their study reported low commonality in liquidity in developed equity markets as compare to emerging equity markets. It is found that the commonality in liquidity is high when the markets are more in volatile phase. Machado and De Medeiros (2012) conducted a study in Brazil equity market where they perceived the presence of a liquidity factor. This study reported the monthly premium with and without risk adjustment. The liquidity premium varies from 1.7%

to 2.8% and 1.24% to 3.04% risk adjusted with CAPM and, Fama and French (1993) three factors model respectively. While on other hand liquidity premium vary from 0.83% to 2.19% without risk adjustment. Chan and Faff (2005) tested the contribution of liquidity in Australian equity market in the frame work of Fama and French (1993) three factors. The study supports the liquidity-augmented Fama–French three factors model. Amihud, Hameed, Kang, and Zhang (2015) conducted study across 45 various countries and documented the presence of positive and statistically significant liquidity premium. Sadaqat and Butt (2017) conducted study in Pakistan equity market, where they specified the significance of liquidity factor in asset pricing. Their study suggests investors to consider liquidity as an important factor in asset pricing model and foreign investors should consider Pakistan equity market for risk diversification. Bangash et al. (2018) consider liquidity factor in amalgamation to momentum factor and document the positive association among momentum factor and stock returns. While, this study considers the significance of liquidity in amalgamation to size and value factors instead of momentum factor in Pakistan Stock Exchange.

3. Research Methodology

The sample size consists of 298 listed firms traded at Pakistan Stock Exchange (PSX) for the period of 2001 to 2015. It covers monthly data of all firms in non-financial sectors i.e 25 sectors. The monthly data of stocks prices, KSE-100 index and share turnover are collected from PSX website. For the measurement of risk-free returns, Treasury bill data are collected from the State Bank of Pakistan while the data for outstanding shares and book equity are collected from the analysis reports of each firm. Those firms are selected from the given sectors which are traded at least eight times a year (Khan, Ali, & Hassan, 2012).

3.1 Mimicking Portfolio

The examination of the relationship among selected risk factors and stock returns are carried out at the portfolio level. For the construction of size, value and liquidity factors, this study follows the procedure of Fama and French (1993). The benefit of formation of mimicking portfolio is to allow the investors to examine the effect of illiquidity whereas adjusting the influence of other Fama and French (1993) three factors.

Size of a firm is measured by the market capitalization of firm at June "t" for one time period. Further the companies are split and ranked into 50:50 on basis of low and high market equity respectively. The firms by low and high market equity is considered small (S) and big (B) firms respectively (Bangash et al., 2018; Banz, 1981; Fama & French, 1993). Same procedure of sorting firms on basis of market capitalization is repeated each year.

The value of the firm is measured by following book to market-equity ratio at the end of each year. Further the firms are ranked and split into 30:40:30 on the bases of B/M ratio into three categories that is H (high), M (medium) and L (low) respectively (Fama & French, 1993). The same criteria of ranking firms on the basis of B/M ratio is repeated each year (Bangash et al., 2018).

Liquidity of the firm is proxy by the share turnover (Chan and Faff, 2005) on monthly basis at June t. The firms are sorted and split into 30:40:30. The firms are categorized into three groups based on liquidity that is I (illiquid), N (moderate liquid) and V (very liquid) and the same procedure is followed each year.

This study constructs 18 portfolios from juncture of two size (50:50), three B/M ratios (30:40:30) and three liquidity (30:40:30) group. These portfolios are namely; S/L/V, S/L/N, S/L/I, S/M/V, S/M/N, S/M/I, S/H/V, S/H/N, S/H/I, B/L/V, B/L/N, B/L/I, B/M/V, B/M/N, B/M/I, B/H/V, B/H/N and B/H/I. The construction of same 18 portfolios is repeated each year. The benefit of the three mimicking portfolio is that it controls the effect of other two respective factors. In constructions of IMV mimicking portfolios each element of very liquid portfolio has a similar illiquid complement i.e. S/L/V vs S/L/I.

3.2 Measurement of Independent Variables

The size mimicking portfolio factor SMB is the difference of small and big average portfolio firms returns, measured as;

SMB = (S/L/V + S/L/N + S/L/I + S/M/V + S/M/N + S/M/I + S/H/V + S/H/N + S/H/I)/9 – (B/L/V + B/L/N + B/L/I + B/M/V + B/M/N + B/M/I + B/H/V + B/H/N + B/H/I)/9 (1)

The book to market mimicking portfolio factor HML is the difference of high and low value average portfolio returns, measured as;

HML = (S/H/V + S/H/N + S/H/I+ B/H/V + B/H/N + B/H/I)/6 - (S/L/V + S/L/N + S/L/I + B/L/V + B/L/N + B/L/I)/6 (2)

The illiquidity mimicking portfolio factor IMV is the difference of illiquid and liquid average portfolio returns, measured as;

IMV = (S/L/I + S/M/I + S/H/I + B/L/I + B/M/I+ B/H/I)/6 – (S/L/V + S/M/V + S/H/V + B/L/V + B/M/V + B/H/V)/6 (3)

3.3 Dependent variable Portfolio Formation

This study uses excess portfolio returns to risk-free, depends on size, value and liquidity factor as dependent variables. All firms are sorted on bases of size, value and liquidity factor, which result in construction of 18 portfolios from the juncture of size (50:50), book to market (30:40:30) and liquidity (30:40:30).

3.4 Procedure

This study uses time series data and uses four different asset pricing models. The first phase is to analyze through the CAPM (Sharpe, 1964) (eq. 4), second is to analyze through the Fama and French three factors model (Fama & French, 1993) (eq. 5). Third phase is to analyze through Capital Asset Pricing Model augmented by liquidity factor and finally the Fama and French three factors model augmented with liquidity factor (eq. 6) and (eq. 7) respectively.

$$R_{pi} - R_f = \alpha_i + \beta_i (R_m - R_f) \quad (4)$$

Where R_{pi} is the return on portfolio $_i$, R_f is risk free return, R_m is return on market portfolio, $(R_{pi} - R_f)$ is the surplus portfolio returns, $(R_m - R_f)$ is the surplus market returns factor, „α“ is alpha that determine unusual profit and „β“ is coefficient of market premium. The concept of Capital Asset Pricing Model is that excess return on portfolio is completely explained via market premium. Therefore, intercept value „α“ should be equal to zero (0). But if the value of „α“ is positively (negatively) significant, it implies that there is abnormal profit (loss). This study further attempts the Fama and French (1993) model as follow;

$$R_{pi} - R_f = \alpha_i + b_i (Rm - R_f) + s_i (SMB) + h_i (HML) \quad (5)$$

Here, SMB presents size premium and HML presents value premium, s_i and h_i are the coefficient of size and value premium. If the value of intercept from CAPM is significant and the value of intercept from Fama and French (1993) three factor model is insignificant, it then implies that Fama and French captures the variation in portfolio returns that have not been explained by CAPM. But on other hand if the

value of Fama and French intercept is statistically significant, it may suggest for another risk factor to complete factor structure. To examine the contribution of liquidity factor on asset pricing model, this study further extends both CAPM and Fama and French three factor model by adding IMV factor as follow;

$$R_{pi} - R_f = \alpha_i + b_i (R_m - R_f) + l_i (\text{IMV}) \quad (6)$$

Where IMV presents liquidity premium and l_i is the coefficient of IMV

$$R_{pi} - R_f = \alpha_i + b_i (Rm - R_f) + s_i (\text{SMB}) + h_i (\text{HML}) + li (\text{IMV}) \quad (7)$$

The equation (7) allows to form the null hypothesis where the intercept (α) may capture the required rate of return estimated by the given asset pricing model (7).

4. Data Analysis

Table 1 shows the descriptive statistics of eight extreme mimicking portfolio returns based on size factor only. S/L/I mean a portfolio consists of small size intersection of low value and illiquid stock firms, similarly B/L/I mean a portfolio consists of big size intersection of low value and illiquid stock firms and so on. The mean returns of the portfolio of small firms are higher as compared to big firms except firms with S/L/I and B/L/I feature. For instance, S/V/L average portfolio returns is 0.79% greater than B/V/L average portfolio returns i.e. 0.43%. The total risk (standard deviation) for small firms is higher than the big firms. For example, S/V/L portfolio risk is 16.29% is less than B/V/L portfolio risk i.e. 10.15%. It reconciles the notion that high risk is rewarded by high return. Similarly, Banz (1981) documents that small firms earn more risk-adjusted returns.

Table 1: Descriptive Statistics for Portfolios Size Based

Variables	Obs.	Mean	Std. Dev.	Min	Max
S/L/V	165	0.007	0.162	-0.321	0.635
S/L/I	165	0.002	0.103	-0.276	0.409
S/H/V	165	0.012	0.130	-0.265	0.438
S/H/I	165	0.010	0.098	-0.321	0.434
B/L/V	165	0.004	0.101	-0.471	0.261
B/L/I	165	0.019	0.082	-0.178	0.390
B/H/V	165	0.000	0.109	-0.511	0.392
B/H/I	165	0.008	0.131	-0.911	0.826

Table 1 report the mean and standard deviation of portfolios construct on size base.

Table 2 reports the descriptive statistics of explanatory factors that is market, size, value and liquidity premium. The result shows that the market risk premium

and liquidity premium are positive. This result is steady with assumption of risk adjusted concept. The average return of size and value premium is negative that is against the assumption of risk aversion. Early literature on anomalies suggests that small firm"s stocks behavior is inconsistent over time and might influence by economic recession or a business cycle (Khan et al., 2012). The literature suggests that these anomalies may sometime disappear, and these factors may behave reverse. Table 3 report the low correlation coefficient between the explanatory factors.

Table 2: Descriptive Statistics for Risk Factors

Risk Factors	Obs.	Mean	Std. Dev.	Min	Max
MKT	165	0.010	0.084	-0.460	0.321
SMB	165	-0.001	0.045	-0.108	0.132
HML	165	-0.000	0.051	-0.162	0.147
IMV	165	0.003	0.082	-0.391	0.320

MKT presents the market premium, SMB presents the size premium, HML presents the value premium and IMV presents the liquidity premium.

Table 3: Correlation coefficient for Risk Factors

Risk Factor	MKT	SMB	HML	IMV
MKT	1			
SMB	-0.086	1		
HML	0.033	-0.021	1	
IMV	-0.508	-0.263	0.167	1

Table 4 reports the alpha values from four various asset pricing models. Panel A reports the alpha"s based on liquidity factors. All the alpha"s values are negative and statistically insignificant except P5 i.e. negative and statistically significant for each four asset pricing models. Similarly, Panel B reports the alpha"s based on size factor. This result shows that all the alpha"s value is negative and statistically insignificant except P5 i.e. negative and statistically significant for each four asset pricing models at 90% significant level.

Panel A reports the alpha values of various asset pricing models i.e. CAPM, F and F three factor model, CAPM and F and F augmented by an illiquidity risk factor. In Panel A, P1 presents the average portfolio returns of the firms with low liquidity

(Illiquidity) and P5 presents with high liquidity. While in Panel B, P1 presents the average portfolio returns of the firms with low market capitalization (Small) and P5 presents with high market capitalization (Big). The value in parentheses presents the value of t-statistic.

Table 4: Comparison of Alphas Across Alternative Risk Factors and Asset Pricing Models

Panel – A Liquidity				
	CAPM	Fama-French	CAPM + IMV	Fama-French + IMV
P1 (Low liquidity)	-0.006	-0.005	-0.006	-0.007
	(-1.3)	(-1.39)	(-1.34)	(-1.75)
P5 (High liquidity)	-0.013	-0.01308	-0.008	-0.008
	(-2.58)	(-2.64)	(-1.72)	(-1.82)
Panel – B Size				
	CAPM	Fama-French	CAPM + IMV	Fama-French + IMV
P1 (Small)	-0.008	-0.006	-0.006	-0.008
	(-1.09)	(-1.47)	(-0.82)	(-1.85)
P5 (Big)	-0.007	-0.007	-0.005	-0.004
	(-2.34)	(-2.33)	(-1.69)	(-1.63)

In table 5, this study reports the alphas and coefficient values of CAPM, F-F three factor model, CAPM and F-F three factor model augmented by liquidity for low and high liquid stocks. To test these models, study follow time series ordinary least square (OLS) estimator where we follow Newey-West standard errors by 4 lags to reflect autocorrelation and heteroscedasticity in portfolio return. The result displays that the explanatory power of CAPM model for P5 is more significant than P1. The coefficient value of the market premium of P5 is significantly high (0.8030 Vs 0.187) than the P1 and the value of R^2 also shows the high contribution in explaining variation in high liquid portfolio returns relative to illiquid (52.9% Vs 8.92% respectively). Result for F-F three factor models vary from P1 to P5. The value of R^2 is same but the result for two factors other than market premium varies to each other. The coefficient of market, size and value premium are positive and highly statistically significant for illiquid firms. On the other hand, the coefficient of liquid firms for market and size premium is positive and significant while the coefficient of value premium is statistically insignificant. The table 5 further shows that by adding liquidity premium to F-F three factors, the coefficient of liquidity premium for P1 is positive and highly significant, whereas the coefficient premium of liquidity for P5 is negative and statistically significant. Although the value of R^2 shows that the contribution level of highly liquid firms relative to low liquid firms is high.

Table 5: Estimation Results Base on Liquidity Portfolios and Different Risk Factors

P1 (Low liquidity)	a_i	b_i	*Si*	h_i	l_i	R^2	*D.W*	*Prob. (F-statistic)*
CAPM	-0.00	0.16				0.06	1.63	0.01
	(-1.30)	(2.56)						
Fama-French	-0.00	0.17	0.42	0.20		0.21	1.76	0.00
	(-1.39)	(2.53)	(7.08)	(2.65)				
CAPM + IMV	-0.00	0.20			0.08	0.07	1.70	0.00
	(-1.34)	(3.02)			(0.79)			
Fama-French + IMV	-0.00	0.27	0.52	0.14	0.18	0.25	1.83	0.00
	(-1.75)	(4.26)	(5.83)	(1.49)	(1.95)			
P5 (High liquidity)	a_i	b_i	*Si*	h_i	l_i	R^2	*D.W*	*Prob. (F-statistic)*
CAPM	-0.01	0.75				0.43	1.94	0.00
	(-2.58)	(8.07)						
Fama-French	-0.01	0.78	0.58	-0.03		0.505	1.76	0.00
	(-2.64)	(9.21)	(4.55)	(-0.26)				
CAPM + IMV	-0.00	0.43			-0.64	0.65	1.87	0.00
	(-1.72)	(5.30)			(-6.45)			
Fama-French + IMV	-0.00	0.45	0.23	0.14	-0.61	0.67	1.89	0.00
	(-1.74)	(5.68)	(2.61)	(1.36)	(-7.10)			

Table 5 reports the alpha and beta estimates of four asset pricing model based on liquidity factor portfolio. The value in parentheses present t-statistics.

Table 6: Descriptive Statistics for Dependent Variables Portfolio

Portfolios	Obs.	Mean	Std. Dev.	Min.	Max.	p-value
S/L/V	165	0.007	0.162	-0.321	0.635	0.025
S/L/N	165	0.004	0.109	-0.343	0.339	0.016
S/L/I	165	0.002	0.103	-0.276	0.409	0.0159
S/M/V	165	-0.002	0.128	-0.666	0.389	0.019
S/M/N	165	-0.007	0.077	-0.222	0.261	0.011
S/M/I	165	0.002	0.074	-0.194	0.299	0.011
S/H/V	165	0.012	0.130	-0.265	0.438	0.020
B/M/V	165	0.002	0.090	-0.359	0.197	0.013
B/M/N	165	0.008	0.064	-0.151	0.275	0.009
B/M/I	165	0.000	0.0633	-0.210	0.154	0.009
B/H/V	165	0.000	0.109	-0.511	0.392	0.016
B/H/N	165	0.000	0.097	-0.351	0.317	0.014
B/H/I	165	0.008	0.131	-0.911	0.826	0.020

Table 6 report the mean, standard deviation, maximum, minimum and p-value for each dependent variable (portfolios) over the time period of 2001 to 2015.

All the variables (18 portfolios) given in table 6, present the excess returns of portfolios. These excess portfolio returns are used as dependent variables in GMM regression approach.

Table 7 presents the eight extreme mimicking portfolios based on size, value and liquidity. These portfolios are the subset of 18 portfolios where there is no portfolio with medium characteristics. This table reports the estimated results of F-F three factor model augmented with liquidity. It shows the direction, intensity and statistically significance of regression coefficient in four factor model. In table 7, it is observed that the market betas for all portfolios are positive and highly statistically significant. Second, the coefficient of size premium is positively and statistically significant for small firms and statistically insignificant for big firms except B/H/V. Third, the results for the book-to-market ratio is positive and statistically significant for S/HV, S/HI, B/HV and B/H/I, while the results for S/L/V, S/L/I and B/L/I coefficients are negative and significant. Fourth, the table 7 result shows that the firms with high liquidity coefficients are negative and the firms with low liquidity are positive and statistically significant.

Table 7: Liquidity Augmented Fama and French (1993) Three Factors Model for Portfolios With "Extreme" Characteristics

Portfolio	a_i	b_i	Si	h_i	l_i	R^2	$D.W$
S/L/V	0.002	0.244*	1.817*	-0.546	-0.738*	0.601	2.155
	(0.26)	(2.37)	(7.76)	(-1.79)	(-3.67)		
S/L/I	-0.010*	0.532*	1.216*	-0.457*	0.572*	0.465	2.477
	(-2.51)	(5.38)	(8.39)	(-3.23)	(5.91)		
S/H/V	0.008	0.130	1.216*	0.855*	-0.816*	0.650	2.111
	(1.59)	(1.15)	(8.39)	(4.73)	(-5.60)		
S/H/I	0.000	0.473*	1.529*	0.645*	0.393*	0.606	1.540
	(-0.05)	(6.35)	(8.01)	(6.63)	(3.53)		
B/L/V	-0.006	0.478*	-0.006	-0.069	-0.596*	0.589	2.397
	(-1.47)	(4.77)	(-0.04)	(-0.40)	(-4.49)		
B/L/I	0.006	0.297*	-0.243	-0.460*	0.174**	0.163	1.406
	(0.92)	(2.88)	(-1.41)	(-2.45)	(1.63)		
B/H/V	-0.009	0.448*	0.280*	0.477*	-0.613*	0.548	1.925
	(-1.53)	(4.07)	(2.14)	(2.59)	(-5.20)		
B/H/I	-0.004	0.397*	0.377	1.041*	0.603*	0.315	2.449
	(-0.55)	(3.84)	(1.68)	(2.38)	(2.59)		

* Indicates statistical significance at 0.05 level.

Table 7 reports the alpha and beta estimates for market, size, value and liquidity premium from Fama and French (1993) three factor augmented via liquidity. Value in parentheses presents the value of t-statistic. DW means Durbin Watson.

5. Conclusion and Recommendations

This study inspects the contribution of liquidity factor in framework of Fama and French (1993) three factors model augmented by liquidity. This study follows the CAPM and Fama and French (1993) three factors model, both augmented by liquidity factor. The liquidity factor has important implication regarding asset pricing model in emerging equity market because the trading procedure is less efficient than developed market. The result of this study confirms the existence of some empirical evidence like developed world while some results are differing. The investors are suggested to invest in small firm‟s portfolio, as its average risk-adjusted returns outperform the average returns of large firm‟s portfolio. Although inconsistency is found in a liquidity base portfolio, but the study concludes that low liquid firm outperform highly liquid firms. But on the other hand, in context of size, highly liquid firms outperform low liquid firms. It is because of the influence of size factor that is highly liquid firms are more influenced by small firms.

The observed results are slightly inconsistent; therefore, this study recommends more empirical work. More specifically it would prefer to consider other proxies of liquidity and long series of data to examine the variation in liquidity-based portfolios. The recent literature support other proxies for the measurement of liquidity: trading volume (Brennan et al., 1998), turnover ratio (Datar et al., 1998), standard deviation and coefficient of variation of turnover ratio (Chordia et al., 2001), illiquidity ratio (Amihud, 2002) and liquidity ratio (Liu, 2006).

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