Liquidity Effect and Asset Pricing Tests in Karachi Stock Exchange

Farhan Ahmed[1] Muhammad Kashif[2]

Abstract

Individual or institutional investors are always interested in devising the profitable portfolios to maximize the wealth. In the highly volatile market like Pakistan, liquidity needs to be considered as a crucial factor to price the returns. This study aims to test the basic liquidity measures known as a turnover ratio and trading volume. Using daily data from all shares listed on Karachi Stock Exchange over the period January 2005 – December 2015, equally weighted and value weighted decile portfolios are constructed. We found that the investors should take a short position in P10 with low turnover ratio and take a long position in P1 with the high turnover ratio. On the basis of trading volume, investors should take a long position in P10 with high trading volume and take a short position in P1 with low trading volume. The study is resulted in contradiction with mean-variance framework because the said portfolios fail to generate abnormal returns constructed on the basis of turnover ratio and trading volume. The results of the study are beneficial for brokerage houses in explaining the variations on portfolio performance in times and the investors to devise the optimal investment strategies in their portfolio choice decisions either investment portfolio based on liquidity turnover ratio or trading volume yields higher or lower returns.

Keywords: Liquidity, asset pricing, portfolio return, turnover, traded volume

Introduction

Liquidity risk has always remained an important factor to analyze and discuss the long term and short term effects on return on investments for investors. Investors are always interested in the liquidity risk to make wise investment decisions. In the capital market, liquidity is captured during the trading of shares and towards the demand of money and liquidity is one of the important element, investors always remain interested about (Keynes, 1936). In literature, liquidity is best described by Amihud and Mendelson (1986) and they have defined the liquidity as the spread of bid-ask prices of stocks and they found a significant relationship between stock return and illiquidity. Illiquidity is basically a concept when an asset can only be sold with some loss because of different preferences of investors. Amihud and Mendelson (1986) are considered as the pioneer of investigating stock return and illiquidity (liquidity) relationship according to the literature. In this way, the investigation was started by other scholars to assess the said relationship, however different and unpredictable results were presented. The consistent

1 , 2 Shaheed Zulfikar Ali Bhutto Institute of Science & Technology, (SZABIST) Karachi

results between stock return and liquidity were found by Amihud and Mendelson (1996), Datar *et al*. (1998), Amihud (2002), Chan and Faff (2005) that also supports the liquidity premium theory. While, the unpredictable results were concluded by Fama and French (1992), Brennan and Subhrahmanyam (1996), Eleswarapu and Reinganum (1993).

With the passage of time, Amihud (2002) contributed by stating the significant results between stock return and liquidity and found a negative relationship even after considering factor loadings like market beta, momentum and size in asset pricing. This study is based on time series models to assess the liquidity risk, by capturing the stock returns variations after constructing the portfolios. Liquidity preference models are tested in UK and USA markets while emerging markets like Asian markets are yet to be tested and cross variations results are going to play a vital role in investment decisions. Jun et al., (2003) conducted the study on 27 stock exchange markets in the world and divided the markets according to the region. The relationship between liquidity and average stock returns was assessed by taking the data from 1992 to 1999. They found the significant impact of liquidity factor on portfolio returns. For Pakistan, they also concluded that there is the positive impact of liquidity factor on stock returns.

Problem Statement

Computing the liquidity risk in order to know the time series variation in stock return has become an area of interest for the investors at the present time. This study aims to assess whether the time series stock return fluctuations: turnover ratio (Datar *et al*., 1998) and trading volume (Brennan et al., 1998) can be assessed by constructing portfolios (portfolios based on liquidity factors mimicking portfolios).

Objectives of the Study

- To prepare the information for investors about the profitable portfolios by measuring the liquidity risk based on capitalization.
- To identify the profitable liquidity factor in the context of Karachi Stock Exchange.
- To prove any return differential or spread exists between portfolios or not.
- To explain the turnover ratio (Datar *et al*., 1998) and trading volume (Brennan *et al*., 1998) in the light of all shares listed in Karachi Stock Exchange (KSE).

The novelty behind this study is, very few studies are undertaken to check the stock return and liquidity relationship using *turnover ratio (Datar et al., 1998) and trading volume (Brennan et al., 1998)* in Asian markets and more specifically in Pakistan. After this study, it is expected that the results will contribute to the literature prominently about the liquidity and stock return relationship in Karachi Stock Exchange (PSX).

The first section of the study is the introduction and motivation of the study, the second section is based on research methodology and the fourth section consists of results

and discussion while the fifth section is based on the conclusion, future research directions, recommendations and limitations.

Literature Review

The Pakistani stock market is considered among the most volatile stock exchange markets in the world with high trading frequency. It was found that transaction cost has a significant impact on the stock prices (Constantinindes, 1986; Heaton & Lucas, 1996 and Vayanos, 1998). Liquidity-adjusted CAPM was also developed on the basis of bid-ask spread (Jacobey *et al*., 2000). The relationship between liquidity and stock return was found by keeping the bid-ask price as liquidity proxy (Amihud & Mendelson, 1986). In this area, many studies have been undertaken to ignore the effect of December data, except few studies including the study of Eleswarapu & Reinganum (1993). The authors in their study reworked on the study of Amihud & Mendelson using the updated data that time and found the relationship stock – liquidity relationship limited to the month of January. In continuation of this argument, Brenan & Subhrahmanyam (1996) extended the study of Amihud & Mendelson by testing the Fama & Fench (1993) three-factor model for assessing the stock – liquidity relationship and concluded by rejecting the results of Brenan & Subhrahmanyam and supported the results of Amihud and Mendelson. Peterson & Fialkowski (1994) focused on the bid-ask price as liquidity proxy which found to be a poor proxy of liquidity and the same results were also witnessed in the study of Brennan & Subhrahmanyam (1996). Such type of studies in which the only bid-ask price was considered as liquidity proxy created gaps in research and researchers started considering other liquidity proxies. Brennan *et al.* (1998) in their study took trading volume as the liquidity proxy; another liquidity proxy turnover ratio was suggested by Datar *et al.* (1998) and Chan *et al*., (2005).

Other liquidity proxies are standard deviation and coefficient of variation of turnover ratio and trading volume, liquidity measure, illiquidity ratio and liquidity ratio suggested by Chordia *et al*. (2001); Pastor & Stambaugh (2003), Ho & Hung (2009), Amihud (2002) and (Lagoarde *et al.*, 2009; Jankowitsch *et al*., 2011) respectively. Lam *et al.* (2011) adopted all these liquidity proxies in their study and found the positive stock-liquidity relationship. Loncarski & Skocir (2018) introduced the eight-factor asset pricing model and they also considered liquidity as an important factor along with factors suggested in Carhart and Fama & French models. Generally, all studies support the results of Amihud & Mendelson (1986). Jacoby *et al*. (2000) explained that the real tool to assess the systematic risk in CAPM model is stock return based on bid-ask price.

To enhance the efficiency of old-fashioned CAPM, Acharya & Pedersen (2005) gave the model and supported the findings of Acahrya & Pedersen (2005). The ratio proposed by Amihud (2002) is widely accepted as one of the most appropriate and

straightforward price impact measures to construct. There is already a large number of existing studies arguing that trading volume is related to liquidity (e.g. Brennan *et al*., 1998; Chordia *et al*., 2001) the contribution of this ratio is to capture the impact of trading volume on stock price movements and translate it into transaction cost (Acharya & Pedersen, 2005). In continuation of the liquidity effect, stock liquidity increases stock price crash risk too (Chang *et al.,* 2017). Specifically, this paper on the basis of the motivation from the literature studies the assessment of liquidity (turnover ratio and trading volume) and expected stock return relationship by considering most commonly used asset pricing model, CAPM. The data and methodology have been discussed in next section.

Data and Methodology

This study is quantitative (mono-method) and deductive based on positivist philosophy. To determine the relationship of liquidity and stock return, the monthly and annual data of 950+ companies listed in Karachi Stock Exchange (KSE) since its inception are collected from 2005 to 2015 and the data is collected from Thomson Reuters DataStream. Different Portfolios of the companies listed in KSE were assembled using the mnemonic codes in Thomson Reuters. Generalized Method of Moments (GMM) technique is applied to assess the CAPM alphas on the basis of turnover ratio and trading volume (See Shaikh & Kashif, 2017). In portfolio construction, turnover ratio (the average of the monthly number of shares traded scaled by the average number of shares outstanding over 3, 6, or 12 months) and trading volume (the average of the monthly value of shares traded over 3, 6, or 12 months) are estimated according to the pattern given by Rodririguez (2009) and Siddiqui *et al*. (2000) at month *t*. In order to check the robustness, separate tables are generated for both measures. After construction of portfolios, to identify the alphas portfolios are estimated in CAPM (Sharpe, 1964 and Lintner, 1965).

$$R_{i,t} - R_{fi} = \alpha_i + \beta_{i,M} \left(R_{m,t} - R^f_i \right) + \varepsilon_{i,t} \text{.....Eq.1}$$

All the companies those were merged, acquired or dead are considered in order to avoid survivorship bias. Survivorship bias states for those companies that do not exist anymore. The reason for including dead companies is to avoid survivorship bias. Some companies' data are ignored because of some reasons like the data of 36 consecutive months is necessarily required to calculate the beta values of portfolios (Florackis *et al*., 2011). Generalized Method of Moment is used for asset pricing estimation, within 10 portfolios (Shaikh & Kashif, 2017). Stocks were classified into decile portfolios according to each of the two proxies and analyzing these portfolios' characteristics (e.g. performance, average market value, and beta). Specifically, at the end of month t-1, stocks are alternatively sorted according to their average values in that month into 10

portfolios. For robustness, both equally weighted and value-weighted portfolio returns in excess of the risk-free rate are calculated and all the portfolios are rebalanced on a monthly basis.

Results and Discussion

The descriptive statistics in Table 1 shows the preliminary findings of decile portfolios constructed on the basis of turnover ratio. From P1 to P10, different portfolios are constructed based on the turnover ratio that includes all shares listed in Karachi Stock Exchange (KSE). To assess the spread of portfolio differential, separate columns can be seen in the last of the table that shows the differences between 10 portfolios computed for turnover ratio, equally weighted returns, value-weighted returns, market value and CAPM betas.

Table 1: *Performance & characteristics of decile portfolios on basis of Turnover Ratio (Jan 2005 – Dec 2015)*

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	*t*-test
Full sample period: January 2005 to December 2015												
EW Returns % p.a.	34.28	49.92	47.91	58.64	40.91	42.09	43.58	22.17	30.21	35.07	.79	0.05
VW Returns % p.a.	38.12	45.43	39.42	47.01	45.66	42.27	43.54	52.52	43.91	31.92	-6.20	-0.39
MV (*million*)	2071.66	2158.99	2159.05	2220.34	2779.66	3488.01	4333.60	5768.83	12054.32	47778.58	45706.93	12.45
CAPM *Beta*	.37	.45	.64	.56	.79	.74	.91	.81	1.32	1.24	.87	18.59

This table reports the characteristics of a portfolio constructed on the basis of Turnover Ratio. All the stocks listed on the KSE during the period January 2005 to December 2015 are sorted at t-1 in ascending order accordingly and they are assigned to ten portfolios. P1 is the decile portfolio containing stocks with the lowest Turnover Ratio and P10 is the decile portfolio contains the stocks with the highest Turnover Ratio. The excess returns on the portfolio are calculated- post ranking returns. P10-P1 stands for the spread between P10 and P1. EW returns corresponds to the annualized average monthly returns of equal weighted portfolios. VW returns correspond to the annualized average monthly returns of value-weighted portfolios. MV is the market value of the stocks in each portfolio. CAPM beta(s) is the average stock betas in each portfolio calculated.

The complete sample is taken from January 2005 to December 2015, to check the performance of portfolios. P1 has got a less equally weighted return (34.28) than P10 (35.07) and P1 has got high value-weighted returns (38.12) than P10 (31.92). The portfolio differential (P10 – P1) is also calculated, the equally weighted (EW) returns difference is 0.79 whereas its t-stats is 0.0538 shows that there is the positive and significant difference between P10 to P1 (Appendix Table 5 & 6). While, the value-weighted (VW) returns difference between P10 and P1 is -6.2 and its t-stats is -0.3908 that gives the insight to the investors to take a short position in P10 with low turnover ratio and to take a long position in P1 with the high turnover ratio. It is also further found

that portfolio P1 that generates the low betas yields high returns and P10 that generates the high betas yields low returns. This result is in contradiction with the mean-variance framework and it further elaborates that the said portfolios fail to generate abnormal returns constructed on the basis of turnover ratio.

In Table 2, the preliminary findings of decile portfolios constructed on the basis of the trading volume are shown. P1 has got a negative equally weighted return (-34.28) and P10 (-15.93) and P1 has got negative and lesser value-weighted returns (-31.53) than P10 (14). The portfolio differential (P10 – P1) is also calculated, the equally weighted (EW) returns difference is 17.64 whereas its t-stats is 0.89 shows that there is the positive and significant difference between P10 to P1 (Appendix Table 5 & 6). While the value-weighted (VW) returns difference between P10 and P1 is 45.53 and its t-stats is 1.7688 that gives the insight to the investors to take a long position in P10 with high trading volume and to take a short position in P1 with low trading volume. It is also further found that portfolio P1 that generates the high betas yields low returns and P10 that generates the lower betas yields high returns. This result is in contradiction with the mean-variance framework and it further elaborates that the said portfolios fail to generate abnormal returns constructed on the basis of trading volume.

Table 2: *Performance & characteristics of decile portfolios on basis of Trading Volume ((Jan 2005 – Dec 2015)*

	P1	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**	**P10-P1**	***t*-test**
Full sample period: January 2005 to December 2015												
EW Returns % p.a.	-33.56	12.12	3.91	10.05	-14.86	-10.68	-1.56	-5.77	-10.75	-15.93	17.64	0.89
VW Returns % p.a.	-31.53	-6.53	-10.61	4.69	-14.42	-15.74	2.65	-5.97	4.90	14.00	45.53	1.77
MV (*million*)	8638.86	3588.34	3308.66	3757.94	5030.12	6881.45	9886.64	17946.35	35873.44	44574.6	35935.73	7.4381
CAPM *Beta*	.91	1.39	.89	1.17	1.08	1.38	1.07	1.27	1.51	1.17	.26	42.11

This table reports the characteristics of a portfolio constructed on the basis of Trading Volume. All the stocks listed on the KSE during the period January 2005 to December 2015 are sorted at t-1 in ascending order accordingly and they are assigned to ten portfolios. P1 is the decile portfolio containing stocks with the lowest Trading Volume and P10 is the decile portfolio contains the stocks with the highest Trading Volume. The excess returns on the portfolio are calculated- post ranking returns. P10-P1 stands for the spread between P10 and P1. EW returns corresponds to the annualized average monthly returns of equal weighted portfolios. VW returns correspond to the annualized average monthly returns of value-weighted portfolios. MV is the market value of the stocks in each portfolio. CAPM beta(s) is the average stock betas in each portfolio calculated.

Table 3 shows the risk-adjusted performance results of CAPM alphas for all value-weighted portfolios constructed on the basis of Turnover Ratio. The spread

between P10 and P1 explains the CAPM completely as the abnormal performance is 0.03006% p.a. *(t-value = 2.31)* at 5% level of significance.

Table 3: *Alphas of Value-Weighted Portfolios sorted by Turnover Ratio (Jan 2005 – Dec 2015)*

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P10-P1	Chi-sq.
Full sample period: January 2005 to December 2015												
CAPM Alpha	.0212 (2.11)**	.0251 (2.06)**	.015 (1.51)	.023 (2.07)**	.015 (1.25)	.014 (1.4)	.010 (.92)	.021 (2.43)**	-0.001 (-.08)	-.009 (-1.58)	.030 (2.31)**	13.390 (.14)

This table shows the alphas of equal-weighted portfolios sorted by the Turnover Ratio. This table reports the abnormal performance of 10 equal-weighted portfolios constructed on the basis of Turnover Ratio. All stocks listed on the Karachi Stock Exchange during the period January 2005–December 2015 are sorted in ascending order according to their Turnover Ratio and they are assigned to 10 portfolios. P1 is the decile portfolio containing the stocks with the lowest Turnover Ratio and P10 is the decile portfolio containing the stocks with the highest Turnover Ratio. P10–P1 stands for the spread between P10 and P1. CAPM alpha is the annualized alpha estimate derived from the Capital Asset Pricing Model. The last column reports the chi-square (v^2) statistic of the Wald test referring to the null hypothesis that the 10 portfolios' alphas are jointly equal to zero; p-values are reported below the statistic.

** 10% level of significance, ** 5% level of significance, *** 1% level of significance*

Table 4 shows the risk-adjusted performance results of CAPM alphas for all value-weighted portfolios constructed on the basis of Trading Volume. The spread between P10 and P1 explains the CAPM completely as the abnormal performance is 0.03967% p.a. *(t-value = 1.82)* at 10% level of significance.

Table 4: *Alphas of Value-Weighted Portfolios sorted by Trading Volume (Jan 2005 – Dec 2015)*

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P1-P10	Chi-sq.
Full sample period: January 2005 to December 2015												
CAPM Alpha	.020 (-1.30)	.004 (0.37)	-.003 (-0.32)	.012 (1.72)*	-.005 (-.76)	-.004 (-.49)	.009 (1.09)	.004 (.48)	.014 (1.37)	.020 (2.43)**	.040 (1.82)*	15.08 (.09)*

This table shows the alphas of equal-weighted portfolios sorted by Trading Volume. This table reports the abnormal performance of 10 equal-weighted portfolios constructed on the basis of Trading Volume. All stocks listed on the Karachi Stock Exchange during the period January 2005–December 2015 are sorted in ascending order according to their Trading Volume and they are assigned to 10 portfolios. P1 is the decile portfolio containing the stocks with the lowest Trading Volume and P10 is the decile portfolio containing the stocks with the highest Trading Volume. P10–P1 stands for the spread between P10 and P1. CAPM alpha is the annualized alpha estimate derived from the Capital Asset Pricing Model. t-statistics are reported in parentheses. The last column reports the chi-square (v^2) statistic of the Wald test referring to the null hypothesis that the 10 portfolios' alphas are jointly equal to zero; p-values are reported below the statistic.

** 10% level of significance, ** 5% level of significance, *** 1% level of significance*

Conclusion

Liquidity risk has always remained an important factor to not only analyze but also discuss in order to know the long-term and short effects on return on investments. Investors are always interested in the liquidity risk to make wise investment decisions. Basically, this study has given repercussions of asset pricing to assess the returns

estimated on the basis of 2 selected liquidity measures includes trading volume and turnover ratio. Specifically for Karachi Stock Exchange, it is suggested that the investors should take a short position with low turnover ratio and take a long position in P1 with the high turnover ratio. On the basis of trading volume, investors should take a long position with high trading volume and take a short position with low trading volume (See Lam *et al*. (2011); Datar *et al.* (1998) & Brennan *et al.* 1998). The results of the study are also inconsistent with the results of Jun *et al*. (2003) and Liang and Wei (2012).

This study can be extended if the data is available since 1990 especially for a daily number of shares traded. This study leads to assess the relationship between liquidity and stock returns on other asset pricing models like Fama & French three-factor, Carhart and Fama & French five-factor model. Multiple liquidity proxies as suggested by Lam *et al*. (2011) can be taken for checking the liquidity factor in the context of shares listed in Karachi Stock Exchange. Furthermore, the impact of macroeconomic variables like inflation, exchange rate, gross domestic product etc can also be checked on the liquidity of all shares listed in Karachi Stock Exchange (KSE). The comparative study is also possible like the comparison between stock markets of some Asian countries to see the liquidity and stock return relationship. The industry wise study can also be conducted for the companies listed in KSE; industry wise portfolio can be constructed say for the automobile industry, oil sector etc.

References

Acharya, V.V. & Pedersen, L.H., (2005). Asset pricing with liquidity risk. *Journal of Financial Economics*, 77(2), 375-410.

Amihud, Y. (2002). Illiquidity and stock return: cross-section and time-series effects. *Journal of Financial Markets*, 5(1), 31-56.

Amihud, Y. & Mendelson, H., (1986). Asset pricing and the bid-ask spread. *Journal of Financial Economics*, 17(2), 223-249.

Shaikh, A.J. & Kashif, M., (2017). Asset growth anomaly and stock returns An evidence from of Karachi Stock Exchange (KSE) market. *Journal of Independent Studies and Research – Management, Social Sciences and Economics 15*(2), 147-164.

Brennan, M.J. & Subrahmanyam, A. (1996). Market microstructure and asset pricing: on the compensation for illiquidity in stock returns. *Journal of Financial Economics*, 41(3), 441-464.

Chan, H. & Faff, R. (2005). Asset pricing and illiquidity premium. *Financial Review*, 40(4), 429-458.

Chang, X., Chen, Y., & Zolotoy, L. (2017). Stock liquidity and stock price crash risk. *Journal of financial and quantitative analysis 52*(4), 1605-1637.

Chordia, T., Roll, R., & Subrahmanyam, A. (2009). Why Has Trading Volume Increased? *Working Paper*. Retrieved from SSRN. <http://ssrn.com/abstract=1364006>.

Constantinindes, G. (1986). Capital market equilibrium with transactions costs. *Journal of Political Economy*, 94(4), 842-862.

Datar, V.T., Naik, N.Y., & Radcliffe, R. (1998). Liquidity and stock return: an alternative test. *Journal of Financial Markets*, 1(2), 203-219.

Eleswarapu, V.R. & Reinganum, M. (1993). The seasonal behaviour of liquidity premium in asset pricing model. *Journal of Financial Economics*, 34(3), 373-386.

Fama, E.F. & French, K.R. (1992). The cross-section of expected stock returns. *Journal of Finance*, 47(2), 427-465.

Fama, E.F. & French, K.R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33(1), 3-56.

Florackis, C., Gregoriou, A., & Kostakis, A. (2011). Trading frequency and asset pricing on the London Stock Exchange: Evidence from a new price impact ratio. *Journal of Banking & Finance*, *35*(12), 3335-3350.

Hasbrouck, J. (2005). Inferring Trading Costs from Daily Data: US Equities for 1962 to 2001. *Working Paper. New York University*.

Heaton, J. & Lucas, D., (1996). Evaluating the effects of incomplete markets on risk sharing and asset pricing. *Journal of Political Economy, 104*(3), 443-497.

Ho, C. & Hung, C., (2009). Investor sentiment as conditioning information in asset pricing. *Journal of Banking and Finance, 33(*5), 892-903.

Jacoby, G., Fowler, D., & Gottesman, A.A. (2000). The capital asset pricing model and the liquidity effect: a theoretical approach. *Journal of Financial Markets*, 3(1), 69-81.

Jankowitsch, R., Nashikkar, A., & Subrahmanyam, M.G. (2011). Price dispersion in OTC markets: a new measure of liquidity. *Journal of Banking and Finance*, 35(2), 343-357.

Jun, S. G., Marathe, A., & Shawky, H. A. (2003). Liquidity and stock returns in emerging equity markets. *Emerging Markets Review*, 4(1), 1-24.

Lagoarde-Segot, T., (2009). Financial reforms and time-varying microstructures in emerging equity markets. *Journal of Banking and Finance*, 33(10), 1755-1769.

Lam, K. S., & Tam, L. H. (2011). Liquidity and asset pricing: Evidence from the Hong Kong stock market. *Journal of Banking & Finance*, *35*(9), 2217-2230.

Liang, S. X., & Wei, J. K. (2012). Liquidity risk and stock returns around the world. *Journal of Banking & Finance*, 36(12), 3274-3288.

Loncarski, I., & Skocir, M. (2018). Multi-factor asset pricing models: factor construction choices and the revisit of pricing factors. *Journal of International Financial Markets, Institutions and Money*.

Pastor, L. & Stambaugh, R.F., (2003). Liquidity risk and expected stock returns. *Journal of Political Economy*, 111(3), 642-685.

Peterson, M. & Fialkowski, D. (1994). Posted versus effective spreads: good prices or bad quotes? *Journal of Financial Economics*, 35(3), 269-292.

Vayanos, D. (1998). Transaction costs and asset prices: a dynamic equilibrium model. *Review of Financial Studies*, 11(1), 1-58.

APPENDIX

Table 5: *Alphas of Equally-Weighted Portfolios sorted by Turnover Ratio (Jan 2005 – Dec 2015)*

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P1-P10	Chi-sq.
Full sample period: January 2005 to December 2015												
CAPM Alpha	.014	.027	.025	.030	.016	.012	.012	.059	-0.004	-0.005	.019	12.76
	(1.41)	(2.19)**	(2.61)***	(2.54)**	(1.33)	(1.09)	(.99)	(.75)	(-.47)	(-.58)	(1.51)	(.17)

This table shows the alphas of equal-weighted portfolios sorted by Turnover Ratio. This table reports the abnormal performance of 10 equal-weighted portfolios constructed on the basis of Turnover Ratio. All stocks listed on the Karachi Stock Exchange during the period January 2005–December 2015 are sorted in ascending order according to their Turnover Ratio and they are assigned to 10 portfolios. P1 is the decile portfolio containing the stocks with the lowest Turnover Ratio and P10 is the decile portfolio containing the stocks with the highest Turnover Ratio. P10–P1 stands for the spread between P10 and P1. CAPM alpha is the annualized alpha estimate derived from the Capital Asset Pricing Model. t-statistics are reported in parentheses. The last column reports the chi-square (v^2) statistic of the Wald test referring to the null hypothesis that the 10 portfolios' alphas are jointly equal to zero; p-values are reported below the statistic.

** 10% level of significance, ** 5% level of significance, *** 1% level of significance*

Table 6: *Alphas of Equally-Weighted Portfolios sorted by Trading Volume Portfolios (Jan 2005 – Dec 2015)*

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P1-P10	Chi-sq.
Full sample period: January 2005 to December 2015												
CAPM Alpha	-.023	.017	.011	.016	-.004	-.001	.007	.004	-.001	-.005	-.018	13.83
	(-2.1)**	(1.59)	(1.41)	(2.07)**	(-.63)	(-.14)	(.81)	(.57)	(-.08)	(-.67)	(-1.07)	(.13)

This table shows the alphas of equal-weighted portfolios sorted by Trading Volume. This table reports the abnormal performance of 10 equal-weighted portfolios constructed on the basis of Trading Volume. All stocks listed on the Karachi Stock Exchange during the period January 2005–December 2015 are sorted in ascending order according to their Trading Volume and they are assigned to 10 portfolios. P1 is the decile portfolio containing the stocks with the lowest Trading Volume and P10 is the decile portfolio containing the stocks with the highest Trading Volume. P10–P1 stands for the spread between P10 and P1. CAPM alpha is the annualized alpha estimate derived from the Capital Asset Pricing Model. t-statistics are reported in parentheses. The last column reports the chi-square (v^2) statistic of the Wald test referring to the null hypothesis that the 10 portfolios' alphas are jointly equal to zero; p-values are reported below the statistic.

** 10% level of significance, ** 5% level of significance, *** 1% level of significance*