

The Study of Relationship between Size, value and Liquidity Risk with Excess Return of stock in Tehran exchange market

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ABSTRACT: Investors always are thinking to earn more profits and reduce the risk, so the different models over the years, has been developed for the assessment of risk and return. The most complete model that has provided is Fama and French model. In this study we investigated the role of various risk factors, including size, value and liquidity on capital asset pricing, and liquidity influence on improving the predictive power of the model. The statistical population of the study is all firms listed in Tehran stock exchange and sample consisting of 155 companies for period of 2007-2011. Research findings indicate that there is no positive relationship between risk factors and excess stock returns in Tehran Stock Exchange.

Keywords: Size, Value, Liquidity, Fama & French model, Predictive Power

INTRODUCTION

Since 1970, capital asset pricing model (CAPM) was used to measure the performance of portfolios. In this model, the only factor that explain differences in stock returns, is beta coefficient. Fama and French in the 1990s showed that this model has not a good performance. They examined the impact of various factors on stock returns and offered a three-factor model including the market factor, size and value to explaining the behavior of stock returns. However, recent research indicates that besides the factors discussed in the CAPM model and 3F&F; also, other factors affect stock returns that liquidity is one of this factors. Liquidity can be defined as the ability to convert assets to cash and cash to assets, having dimensions of speed, impact of price and transaction costs. Liquidity concept is unrealistic, so it can not be measured separately. Hence, different measures presented to calculating of different aspects of liquidity. Lee (2011) examined the relationship between liquidity and asset pricing at the international level, and found that liquidity has an impact on the pricing of capital assets. So far, empirical studies have investigated the impact of risk factors only focusing on developed markets and is not performed a comprehensive study to survey of the impact of these factors on stock returns in Tehran Stocks Exchange. Therefore, this study represent the modified Fama and French model based on the liquidity factor, also examine the relation between liquidity, size and value of the stock returns in Tehran Stock Exchange. In addition, in this study to assessment of liquidity, two measures include stock TURNOVER and AMIHU are used.

Literature And Research Background

Literature Review

there is substantial empirical evidence that stock returns can be better explained by a combination of risk factors rather than by a single-factor model. the seminal studies by Fama and French (1992, 1993, 1998) show that a combination of size and book-to-market ratio is better able to capture the cross-section of stock returns than the market beta alone. In fact, the Fama and French three-factor asset pricing model was developed as a response to poor performance of the CAPM in explaining excess returns. they based their model on the fact that average excess portfolio returns are sensible to three factors namely: 1) market factor; 2) SMB; and 3) HML.

the results of these studies have not remained uncontested, with a number of papers suggesting explanations behind the size and book-to-market factors and extensions to the original Fama–French three-factor model (Bauer et al., 2010; de Groot and Verschoor, 2002; Ferson and Harvey, 1999; Griffin, 2002; Hyde and Sherif, 2010; Liew and Vassalou, 2000; Llewellyn, 1999; Malkiel and Jun, 2009; Shum and Tang, 2005). In particular, the seminal paper of Amihud and Mendelson (1986) paved the way to numerous studies suggesting

that liquidity explains stock returns after the three Fama-French factors have been accounted for. In the study of Brennan and Subrahmanyam (1996) liquidity is discussed of being a relevant factor for influencing asset pricing. another explanation for the relevance of liquidity is provided by Brennan and Subrahmanyam (1996) who note that a primary cause of illiquidity in financial markets is the adverse selection which arises from the presence of informed traders. They argue that liquidity effects of asymmetric information are most likely to be captured in the price impact of trade.

Liquidity can be defined as the difficulty of converting cash into assets and assets into cash. It has several dimensions: immediacy, transaction costs and price impact. Liquidity is an illusive concept which allows no single measure. Therefore, a number of liquidity measures have been proposed, capturing diverse aspects of liquidity. In this study we use two liquidity measures which are described in more detail below:

Turnover is one of the frequently used measures of liquidity (Datar et al., 1998; Haugen and Baker, 1996; Lam and Tam, 2011; Lesmond, 2005a; Nguyen et al., 2007; Rouwenhorst, 1999). Constantinides (1986) proves theoretically that investors react to higher trading costs by reducing the frequency and volume of their trades, which results in lower turnover. Thus, turnover allows us to capture average trading costs over the cross-section of trade sizes whereas quoted bid-ask spread measures the cost of a round-trip small size transaction. This measure is defined as:

$$TO_{i,t} = \text{vol}_{i,t} / \text{share}_{i,t}$$

Amihud (2002) develops an illiquidity ratio which is defined as the ratio of absolute return to volume. The intuition for this measure is that liquid securities can accommodate large trading volumes with small price concessions. This measure is defined as:

$$= \text{Illiquid}_{i,t}$$

Study Background

Fama and French, tested their three-factor model in 1993. The statistical community of the study includes all companies listed NYSE, AMEX and NASDAQ from 1963 to 1990. In this paper, portfolios are rated based on value-weighted and the variables examined using time-series regression. Finally, they concluded that there is an inverse relationship between size and average stock returns. Also, there is a direct relationship between the book to market value ratio and average stock returns. Fama and French, in other research in 1996, began to test the three-factor model. The statistical population of the study period in 1993 was similar to previous research, with the difference that in this study the portfolios with equal weights were used. The results showed that the use of equal-weight portfolios, compared to previous method, offers the evidence about the average of returns effectively. In a study on the Malaysian market Drew and Veeraraghavan (2002) find that both size and value are relevant factors in asset pricing. Van der Hart et al. (2003) confirm this result for internationally diversified stock portfolios of 32 emerging markets, but find weaker evidence of these effects for individual country portfolios. Dey (2005) studies liquidity as measured by turnover as a determinant of cross-sectional returns for 49 global stock index portfolios. The empirical findings indicate a positive relation between return and turnover. Claessens and Dasgupta (1995) study the cross-section of stock returns in 20 emerging markets. They find that in addition to the market beta, size and trading volume have significant explanatory power in a number of markets, albeit with an opposite influence to the one found for developed markets.

Hearn (2010) studies the size, value and liquidity effects for industry blue-chips in South-Asian markets. The author concludes that size drives the return variability in Sri Lanka, while liquidity plays an additional role in Pakistan and Bangladesh and in a few industries in India. Lam and Tam (2011) investigated the influence of liquidity on returns jointly with known time-series determinants for stock returns (market size, value, momentum and higher-moment factors) for the Hong Kong stock market. They find that liquidity is an important factor for explaining stock returns in this setting. In a consecutive study, Hearn (2011) finds evidence for size and liquidity being priced factors in Morocco, whereas the results for other North African countries is rather mixed. Chou and others (2004), studied Fama and French model in non-financial firms, member of NYSE, AMEX and NASDAQ, during 1963 to 2001. The results indicate a negative relationship between size and stock returns and positive relationship between the ratio of book value to market value of the stock returns. Akbari Moghaddam et al. (2010) compared the predictive power of expected return Fama and French three-factor model with RBM model in Tehran Stock Exchange. The findings show that the Fama and French model is superior to the RBM model and the relationship between expected returns with firm size is direct and book to market ratio with the expected return is indirect. Qazalche and Abbasi (2012), examined the impact of Fama and French three-factor model on the distribution of portfolio returns. In this study, six portfolios based on size and book to market value ratio for the years 2004 to 2009, were formed. The findings show that Fama and French three-factor model better explains the distribution of portfolio returns compared to single-factor model.

MATERIALS AND METHOD

The methodology of the study is descriptive; of correlative type, and to explore the correlation between variables, post-event method is used. To test of the study hypotheses, correlation method was chosen. The study period includes years 2007 to 2011. The data used in the study were extracted from the Tehran Stock Exchange Market databases, Rahavardnovin software database, TadbirPardaz software database, weekly reports and financial statements of companies. To analyse data, excel and Spsssoftwares are used.

Study Population and sample selecting

The statistical population of the study includes all the companies listed in TSE, except investment companies, insurance and banks with the following conditions:

Company should have been listed before 2007 in Tehran Stock Exchange Market and been active until the end of 2011.

Company should have not changed its fiscal year during fiscal years 2007 to 2011 and its fiscal year ending in March.

There must not be any interruption of the company's transactions more than 6 months.

Necessary information on the company must be available.

Companies must operate in the manufacturing sector.

According to the conditions mentioned above, 155 companies met our conditions and were chosen as the statistical sample of the research.

Study Hypotheses

For this study three hypotheses are presented as follow

There is a positive relation between portfolio liquidity and portfolio excess return in Tehran exchange.

There is a positive relation between portfolio size and portfolio excess return.

There is a positive relation between portfolio value and portfolio excess return.

regression Model

As previously mentioned, this study investigate the effect of liquidity on the expected returns predictive power of the Fama and French three-factor model. So, based on the Fama and French model, a four-factor model are presented as follows:

$$r_{jt} = \alpha_j + \beta_{jm}r_{mt} + \beta_{jsmb}SMB_t + \beta_{jhml}HML_t + \beta_{jimv}IMV_t + v_{jt}$$

where r_{jt} is the excess return on portfolio j , r_{mt} is the excess market return, SMB_t is the mimicking portfolio for the size factor, HML_t is the mimicking portfolio for the book-to-market factor, IMV_t is the mimicking portfolio for the illiquidity factor, α_j is the intercept of portfolio j and β_{jm} , β_{jsmb} , β_{jhml} , and β_{jimv} are the sensitivities to the risk factors.

Portfolios Formation

The size portfolios are split into small (S) and big (B) according to the median market value. We sort stocks into the three book-to-market portfolios according to the 3rd and 6th deciles of the ranked book-to-market values: low (L), medium (M) and high (H). From the intersection of the relevant size and book-to-market deciles we construct six portfolios: S/L, S/M, S/H, B/L, B/M, B/H. We then calculate monthly value-weighted returns on the six portfolios. Each year the six portfolios are re-formed again based on the new values of the market and book equity.

In order to investigate possible liquidity-effects we use illiquidity-ratios to portion the stocks into portfolios containing illiquid (I) and very liquid (V) stocks. Low values of the illiquidity measures indicate high liquidity, whereas high values of the measures indicate high illiquidity. We sort the stocks into the portfolios according to the average of each of the previously presented illiquidity measures across all stocks in a given year. The SMB (small minus big) factor, which mimics the risk factor in returns related to size, is calculated as the difference between the averages of the monthly returns on the three small (S/L, S/M, S/H) and the three big (B/L, B/M, B/H) size portfolios. The returns on the HML (high minus low) risk factor are correspondingly the difference between the simple average of the monthly returns on the two high-book-to-market (S/H, B/H) and the two low-book-to-market (S/L, B/L) portfolios. The IMV (illiquid minus very liquid) factor, mimicking the risk factor in returns in relation to liquidity, is the difference between the simple average of the monthly returns on the difference of illiquid (I/L/S, I/M/S, I/H/S, I/L/B, I/M/B, I/H/B) and very liquid stocks (V/L/S, V/M/S, V/H/S, V/L/B, V/M/B, V/H/B). The proxy for the market factor is the excess market return $r_{mt} = R_{mt} - R_{ft}$.

Table 1. result of first hypothesis test

P-value	CONSTANT	Prob ofIMV	Coefficient of IMV	Prob of F	F	Adj R ²	R ²	Pearson Correlation	Portfolio
0/870	-0/004	0/000	-2/510	0/000	1013/118	0/945	0/946	-0/973*	I/S/H
0/682	0/017	0/000	-3/609	0/000	855/772	0/935	0/937	-0/968*	I/S/M
0/274	0/077	0/000	-1/662	0/000	63/609	0/515	0/523	-0/723*	I/S/L
0/298	0/019	0/083	0/095	0/083	3/103	0/034	0/051	0/225**	I/B/H
0/248	0/076	0/473	0/142	0/473	0/521	-0/008	0/009	0/094	I/B/M
0/198	0/086	0/905	0/024	0/905	0/014	-0/017	0/000	0/016	I/B/L
0/757	-0/006	0/000	-1/736	0/000	974/408	0/943	0/944	-0/972*	V/S/H
0/928	0/011	0/000	-11/34	0/000	1048/998	0/947	0/948	-0/973*	V/S/M
0/013	0/031	0/000	-0/177	0/000	23/142	0/273	0/285	-0/534*	V/S/L
0/280	0/014	0/109	0/061	0/109	2/643	0/027	0/044	0/209	V/B/H
0/187	0/110	0/517	0/161	0/517	0/426	-0/010	0/007	0/085	V/B/M
0/106	0/111	0/018	-0/494	0/018	5/958	0/078	0/093	-0/305*	V/B/L
0/709	-0/003	0/676	-0/007	0/676	0/176	-0/014	0/003	-0/055	I/S/H
0/158	0/406	0/000	7/322	0/000	137/829	0/699	0/704	0/839*	I/S/M
0/099	0/082	0/000	0/670	0/000	38/667	0/390	0/400	0/632*	I/S/L
0/268	0/026	0/027	0/598	0/027	5/209	0/082	0/102	0/319**	I/B/H
0/938	0/001	0/201	-0/043	0/201	1/674	0/011	0/028	-0/167	I/B/M
0/554	0/007	0/560	0/016	0/560	0/344	-0/011	0/006	0/077	I/B/L
0/163	0/087	0/000	1/579	0/000	135/127	0/695	0/700	0/836*	V/S/H
0/118	0/179	0/000	2/483	0/000	100/234	0/627	0/633	0/796*	V/S/M
0/076	0/119	0/000	0/791	0/000	29/764	0/328	0/339	0/582*	V/S/L
0/216	0/014	0/000	-0/153	0/000	40/655	0/402	0/412	-0/642*	V/B/H
0/129	0/092	0/000	-0/685	0/000	27/321	0/308	0/320	-0/566*	V/B/M
0/083	0/111	0/002	-0/458	0/002	11/026	0/145	0/160	-0/400*	V/B/L

* Correlation is significant at the 0.01 level. ** Correlation is significant at the 0.05 level.

Table 2. result of second hypothesis test

P-value	CONSTANT	Prob of SMB	Coefficient of SMB	Prob of F	F	Adj R ²	R ²	Pearson Correlation	portfolio
0/311	0/035	0/000	0/683	0/000	463/324	0/887	0/889	0/943*	S/H
0/213	0/113	0/000	1/519	0/000	336/074	0/850	0/853	0/923*	S/M
0/030	0/078	0/000	0/436	0/000	179/338	0/751	0/756	0/869*	S/L
0/135	0/018	0/000	-0/054	0/000	23/003	0/272	0/284	-0/533*	B/H
0/127	0/096	0/001	-0/201	0/001	12/199	0/160	0/174	-0/417*	B/M
0/090	0/111	0/076	-0/108	0/076	3/255	0/037	0/053	-0/231**	B/L
0/263	0/040	0/000	0/752	0/000	525/679	0/899	0/901	0/949*	I/S/H
0/229	0/085	0/000	1/033	0/000	255/514	0/812	0/815	0/903*	I/S/M
0/059	0/096	0/000	0/612	0/000	177/024	0/749	0/753	0/868*	I/S/L
0/211	0/020	0/000	-0/063	0/000	17/980	0/223	0/237	-0/486*	I/B/H
0/147	0/087	0/001	-0/192	0/001	12/163	0/159	0/173	-0/416*	I/B/M
0/113	0/099	0/007	-0/159	0/007	7/701	0/102	0/117	-0/342*	I/B/L
0/405	0/027	0/000	0/501	0/000	290/527	0/831	0/834	0/913*	V/S/H
0/204	0/212	0/000	3/379	0/000	487/596	0/892	0/894	0/945*	V/S/M
0/008	0/035	0/000	0/046	0/000	15/208	0/194	0/208	0/456*	V/S/L
0/225	0/014	0/001	-0/037	0/001	11/649	0/153	0/167	-0/409*	V/B/H
0/104	0/124	0/001	-0/237	0/001	11/621	0/153	0/167	-0/409*	V/B/M
0/062	0/134	0/809	-0/016	0/809	0/059	-0/016	0/001	-0/032	V/B/L
0/738	-0/003	0/551	-0/004	0/551	0/359	-0/011	0/006	-0/078	I/S/H
0/288	0/185	0/000	3/482	0/000	473/440	0/889	0/891	0/944*	I/S/M
0/205	0/071	0/000	0/216	0/000	17/592	0/219	0/233	0/482*	I/S/L
0/493	0/017	0/643	-0/106	0/643	0/218	-0/017	0/005	-0/069	I/B/H
0/880	0/002	0/189	-0/019	0/189	1/764	0/013	0/030	-0/172	I/B/M
0/543	0/008	0/959	-0/001	0/959	0/003	-0/017	0/000	-0/007	I/B/L
0/297	0/040	0/000	0/752	0/000	463/214	0/887	0/889	0/943*	V/S/H
0/186	0/102	0/000	1/204	0/000	291/618	0/831	0/834	0/913*	V/S/M
0/078	0/088	0/000	0/457	0/000	101/003	0/629	0/635	0/797*	V/S/L
0/178	0/017	0/000	-0/053	0/000	22/597	0/268	0/280	-0/529*	V/B/H
0/126	0/102	0/001	-0/213	0/001	12/136	0/159	0/173	-0/416*	V/B/M
0/091	0/115	0/076	-0/112	0/076	3/275	0/037	0/053	-0/231**	V/B/L

* Correlation is significant at the 0.01 level. ** Correlation is significant at the 0.05 level.

Table 3. result of Third hypothesis test

P-value	CONSTANT	Prob of HML	Coefficient of SMB	Prob of F	F	Adj R ²	R ²	Pearson Correlation	Description	
0/076	0/168	0/000	1/321	0/000	14/984	0/192	0/205	0/453*	S/H	F&F
0/072	0/396	0/001	2/701	0/001	11/610	0/152	0/167	0/408*	S/M	
0/064	0/135	0/222	0/323	0/222	1/525	0/009	0/026	0/160	S/L	
0/955	-0/001	0/000	-0/259	0/000	40/199	0/399	0/409	-0/640*	B/H	
0/971	-0/002	0/000	-1/462	0/000	76/836	0/562	0/570	-0/755*	B/M	
0/513	0/033	0/000	-1/261	0/000	47/047	0/438	0/448	-0/669*	B/L	
0/068	0/188	0/000	1/481	0/000	16/001	0/203	0/216	0/465*	I/S/H	
0/083	0/271	0/004	1/704	0/004	9/201	0/122	0/137	0/370*	I/S/M	
0/086	0/176	0/222	0/454	0/222	1/522	0/009	0/026	0/160	I/S/L	
0/833	-0/003	0/000	-0/324	0/000	37/253	0/381	0/391	-0/625*	I/B/H	
0/892	-0/006	0/000	-1/398	0/000	75/898	0/559	0/567	-0/753*	I/B/M	
0/811	0/011	0/000	-1/360	0/000	65/968	0/524	0/532	-0/729*	I/B/L	
0/103	0/120	0/001	0/887	0/001	11/171	0/147	0/161	0/402*	V/S/H	TO
0/063	0/872	0/000	6/526	0/000	15/057	0/192	0/206	0/454*	V/S/M	
0/005	0/043	0/238	0/063	0/238	1/423	0/007	0/024	0/155	V/S/L	
0/772	0/004	0/003	-0/137	0/003	9/668	0/128	0/143	-0/378*	V/B/H	
0/898	0/007	0/000	-1/757	0/000	76/214	0/560	0/568	-0/754*	V/B/M	
0/225	0/074	0/000	-1/080	0/000	23/889	0/280	0/292	-0/540*	V/B/L	
0/711	-0/003	0/979	0/001	0/979	0/001	-0/017	0/000	0/003	I/S/H	
0/075	0/862	0/000	6/669	0/000	14/686	0/188	0/202	0/449*	I/S/M	
0/064	0/117	0/035	0/491	0/035	4/651	0/058	0/074	0/272**	I/S/L	
0/422	0/020	0/526	0/098	0/526	0/408	-0/013	0/009	0/094	I/B/H	
0/770	-0/005	0/098	-0/095	0/098	2/823	0/030	0/046	-0/215**	I/B/M	
0/725	0/004	0/210	-0/058	0/210	1/606	0/010	0/027	-0/164	I/B/L	
0/074	0/186	0/000	1/452	0/000	14/931	0/191	0/205	0/452*	V/S/H	AMIHUD
0/070	0/323	0/002	2/067	0/002	10/393	0/137	0/152	0/390*	V/S/M	
0/103	0/137	0/659	0/134	0/659	0/196	-0/014	0/003	0/058	V/S/L	
0/821	-0/003	0/000	-0/262	0/000	41/389	0/406	0/416	-0/645*	V/B/H	
0/979	-0/001	0/000	-1/551	0/000	76/214	0/560	0/568	-0/754*	V/B/M	
0/511	0/035	0/000	-1/289	0/000	45/371	0/429	0/439	-0/663*	V/B/L	

* Correlation is significant at the 0.01 level.
 ** Correlation is significant at the 0.05 level.

Findings

First Hypoteses

The test of the first hypothesis shows that the relationship between liquidity and excess returns in none of the baskets formed using stock turnover measure, is not verified. Also the test of the hypothesis by forming portfolios using Amihud measure indicates that the relationship between returns and liquidity in the portfolios I/S/M and V/S/H is positive strongly, and the relationship in the portfolios I/S/L, V/S/M and V/S/L is moderate positive. In the other portfolios correlation between returns and liquidity is negative or not significant.

Second Hypoteses

The second hypothesis test, using Fama and French method shows there is a strong positive relationship between size and returns in small portfolios, but a negative relationship in the other portfolios was observed. Also, the test of the modified Fama and French model by measure of turnover suggests that there is a positive correlation between size and turnover for small portfolios, but its relationship with return of large portfolios is negative. Therefore, the hypothesis in all liquid and illiquid small size portfolios is approved. Also, the results of modified Fama and French model testing using Amihud measure confirms the research hypothesis in small portfolios except for the I/S/H.

THIRD HYPOTHESIS RESULTS

The third hypothesis test using the Fama and French model for portfolios S/H and S/M is approved but other portfolios rejected. The testing of modified model of Fama and French using measure of turnover indicates that the hypothesis for portfolios I/S/H, I/S/M, V/S/H and V/S/M is confirmed. Also the modified model test, using Amihud measure, show that the correlation between portfolio returns and the portfolio value in V/B/H, V/B/M and V/B/L is negative strongly, and for portfolios I/S/M and V/S/H is moderate positive. In other portfolios this correlation is weak and not significant.

RESULTS

As mentioned earlier, the purpose of this study is to answer the question that whether the liquidity factor improves Fama and French model or not?. According to the table below, the t-test significance level was achieved greater than 5%. This shows that adding liquidity factor to Fama and French (with either Turnover or Amihud measure), does not help to improve the model

Table 4.

Prob.	d.f	T	Mean	Description
.624	5	.522	.048667	$B_{SMBJ} - B_{SMBJ(I-TO)}$
.527	5	-.679	-.226833	$B_{SMBJ} - B_{SMBJ(V-TO)}$
.587	5	-.580	-.215500	$B_{SMBJ} - B_{SMBJ(I-AMIHU)}$
.509	5	.711	.040000	$B_{SMBJ} - B_{SMBJ(V-AMIHU)}$
.484	5	.756	.13433	$B_{HMLJ} - B_{HMLJ(I-TO)}$
.469	5	-.783	-.52317	$B_{HMLJ} - B_{HMLJ(V-TO)}$
.240	5	-1.333	-.95717	$B_{HMLJ} - B_{HMLJ(I-AMIHU)}$
.268	5	1.246	.13533	$B_{HMLJ} - B_{HMLJ(V-AMIHU)}$

DISCUSSION

According to the results of hypotheses tests, it can not be said that there is a positive relationship between portfolio returns and risk factors (liquidity, size and book-to-market value ratio). So, all three hypotheses of the study are rejected. Also, comparing the coefficients of Fama and French model, before and after adding the liquidity factor showed that this factor does not improve the model. The results of the study are in accordance with results of Lischewski and Voronkova (2011) in the stock market of Eastern Europe (WSE).

REFERENCES

- Amihud Y, Mendelson H, Lauterbach B. 1997. Market microstructure and securities values: evidence from the Tel Aviv stock exchange. *Journal of Financial Economics* 45, 365–390.
- Amihud Y, Mendelson H., 1986. Asset pricing and the bid-ask spread. *Journal of Financial Economics* 17, 223–249.
- Amihud Y. 2002. Illiquidity and stock returns: cross-section and time-series effects. *Journal of Financial Markets* 5, 31–56.
- Brennan MJ, Chordia T, Subrahmanyam A. 1998. Alternative factor specifications, security characteristics, and the cross-section of expected stock returns. *Journal of Financial Economics* 49, 345–373.
- Brennan MJ, Subrahmanyam A. 1996. Market microstructure and asset pricing: on the compensation for illiquidity in stock returns. *Journal of Financial Economics* 41, 441–464.
- Bruner RF, Conroy RM, Estrada J, Kritzman M, Li W. 2002. Introduction to 'valuation in emerging markets'. *Emerging Markets Review* 3, 310–324.
- Claessens S, Dasgupta S. 1995. The cross-section of stock returns: evidence from the emerging markets. *World Bank Policy Research Working Paper* 1505.
- Constantinides GM. 1986. Capital market equilibrium with transaction costs. *Journal of Political Economy* 94, 842–862.
- Datar VT, Narayan YN, Radcliffe R. 1998. Liquidity and stock returns: an alternative test. *Journal of Financial Markets* 1, 203–219.
- De Groot CG, Verschoor WF. 2002. Further evidence on Asian stock return behavior. *Emerging Markets Review* 3, 179–193.
- Dey MK. 2005. Turnover and return in global stock markets. *Emerging Markets Review* 6, 45–67.
- Drew ME, Veeraraghavan M. 2003. Beta, firm size, book-to-market equity and stock returns—further evidence from emerging markets. *Journal of the Asia Pacific Economy* 8, 354–379.
- Fama EF, French KR. 1998. Value versus growth: the international evidence. *Journal of Finance* 53, 1975–1999.
- Fama EF, French KR. 1992. The cross-section of expected stock-returns. *Journal of Finance* 47, n 427–465.
- Fama EF, French KR. 1993. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics* 33, 3–56.
- Ferson W, Harvey C. 1999. Conditioning variables and the cross section of stock returns. *Journal of Finance* 54, 1325–1360.
- Griffin JM. 2002. Are the Fama and French Factors global or country specific? *The Review of Financial Studies* 15, 783–803.
- Haugen RA, Baker NL. 1996. Commonality in the determinants of expected stock returns. *Journal of Financial Economics* 41, 401–439.
- Hearn B. 2010a. Liquidity and valuation in East African securities markets. *South African Journal of Economics* 77 (4), 553–576.
- Hearn B. 2010b. Time varying size and liquidity effects in South Asian equity markets: a study of blue-chip industry stocks. *International Review of Financial Analysis* 19, 242–257.
- Hearn B. 2011a. Modelling size and liquidity in North African industrial sectors. *Emerging Markets Review* 12, 21–46.
- Hearn B. 2011b. Size and liquidity effects in Japanese regional stock markets. *Journal of the Japanese and International Economies* 25 (2), 157–181.
- Hyde S, Sherif S. 2010. Tests of the conditional asset pricing model: further evidence from the cross-section of stock returns. *International Journal of Finance & Economics* 15 (2), 198.
- Lam KS, Tam LH. 2011. Liquidity and asset pricing: Evidence from the Hong Kong stock market. *Journal of Banking and Finance* 35 (9), 2217–2230.
- Lee KH. 2011. The world price of liquidity risk. *Journal of Financial Economics* 99 (1), 136–161.
- Lesmond D. 2005b. Liquidity of emerging markets. *Journal of Financial Economics* 77, 1009–1038.
- Nguyen D, Mishra S, Prakash A, Ghosh DK. 2007. Liquidity and asset pricing under the three-moment CAPM paradigm. *The Journal of Financial Research* 30, 379–398.
- Lesmond D. 2005a. Liquidity-augmented capital asset pricing model. *Journal of Financial Economics* 77, 411–452.
- Liew J, Vassalou M. 2000. Can book-to-market, size and momentum be risk factors that predict economic growth? *Journal of Financial Economics* 57, 221–245.
- Liewellen J. 1999. The time-series relations among expected return, risk and book-to-market. *Journal of Financial Economics* 54, 5–43.
- Liewellen J. 1999. The time-series relations among expected return, risk and book-to-market. *Journal of Financial Economics* 54, 5–43.

Malkiel B, Jun D.2009.The "value" effect and the market for Chinese stocks. *Emerging Markets Review* 10, 227–241.

Rouwenhorst G.1999. Local factors and turnover in emerging markets. *Journal of Finance* 54, 1439–1464.

Shum WC, Tang GY.2005. Common risk factors in returns in Asian emerging stock markets. *International Business Review* 14, 695–717.

Van der Hart J, Slagter E, Van Dijk D.2003. Stock selection strategies in emerging markets. *Journal of Empirical Finance* 10, 105–132.