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An Investigation of the Relationship Between Modern Liquidity Measures and Stock Returns

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***Abstract* – Stock return has been considered as one of the most important issues in accounting. Stockholders tend to maintain or increase their wealth through increase in stock prices or cash profits. The present study is aimed to investigate the relationship between modern comprehensive liquidity index and stock returns in 136 companies listed in Tehran stock exchange, which have been assessed in form of pooled data through econometrics software of Eviews. The obtained results indicate that there is no significant correlation between comprehensive liquidity and net cash balance index with stock return.**

***Keywords* – Comprehensive liquidity index, Net liquidity balance, Stock return, Tehran Stock Exchange.**

I. INTRODUCTION

According to Lyroudi (2000) capital market plays a key role in economy of countries and paying attention to this market and decision making basis on it is essential. As the purpose of investors is gaining maximum wealth, if companies are successful in making value, not only investors but also whole society will benefit from the gained value. By considering the importance of role of capital market, evaluation of profit making process and companies liquidity index have been presented by several methods. One of these methods is application of financial ratios which has been employed since the early twentieth century. Indices which consider the liquidity of these companies have been under particular attention by the analysts (Nasirzadeh & Rostami, 2012).

This issue has made financial analysts (Melyk & Birita, 1974; Richard & Laughlin, 1980;Shulman & Cox 1985) to analyze defects of traditional indices (Current and quick ratios) so to be able to present novel indices (Batten and Vo, 2014). The mentioned indices consider defects and shortcomings of traditional liquidity indices such as lack of considering degree of liquidity of the current assets and payment time of current liabilities as well as lack of considering combination of inventories. In addition, as managers can manipulate current obligations through identification of increase in revenue (credit sale) or delay of identification of costs (Allowance to reduce receivables), cash flows are better indices than profit for performance evaluation (Shian-Hou, 2004).

According to importance of liquidity indices and their effect on identification and prediction of other financial variables, the objective of the present study is to investigate the impact of liquidity indices on stock returns.

II. THEORETICAL LITERATURE AND RESEARCH REVIEW

Performance evaluation of the companies has constantly gained attention of stockholders, investors and financial creditors such as banks, financial institutes, creditors and especially managers. Performance evaluation in financial terms can be conducted using two indices of liquidity power and profitability. Profitability is a sign for the lack of economic firm's sickness. Power of liquidity is also a sign of continuing life of economic firm (Talebi, 1996). The indices that evaluate liquidity status of companies have gained attention of analysts since long ago. This has made analysts to be able to present novel indices through analyzing defects of traditional indices (Khoshtinat & Namazi, 2004). The indices examine defects resulted from traditional liquidity indices that are induced by lack of considering details of liquidity status of companies. On the other hand, profitability of companies which is evaluated mostly through reported profit is one of the most important pieces of information that is considered at the time of decision making by people. Financial analysts also consider reported profit as a brilliant factor for their evaluations and judgments. In addition, investors rely on information of financial statements of economic entity, especially reported profits for making decisions (khajavi et al., 2010).

2.1 *Index of traditional liquidity measures*

In traditional liquidity measure, the main focus is that the more the current assets are than the current liabilities, the more desirable liquidity status would be. In other words, current assets, regardless of their combination, indicate payment power and current liabilities, regardless of their combination, indicate cash needs of a company. Accordingly, current and quick ratios are introduced for the measurement of liquidity status. For a long time, these ratios have being applied as indices for evaluation of power of liabilities. Defects of the indices have been constantly under focus by analysts, especially in capital market. Among them, one can refer to lack of considering degree of liquidity of current assets and speed of repayment of current liabilities.

2.2 *Index of Modern liquidity Measures*

According to the defects of traditional liquidity measures, financial researchers introduced indices which can meet the mentioned defects and can also consider details of liquidity status of companies. Modern liquidity indices include comprehensive liquidity index, cash conversion cycle index, net liquidity balance, adjusted cash conversion cycle index, Lamba index and maturity matching of current liability and receivable index. Among the indices, it has been impossible to estimate indices such as Lamba Index, adjusted cash conversion cycle index and maturity matching of current liability and receivable index. The reason is lack of access to information such as surplus liquidity, credit in the current accounts and expected cash flow. Hence, the studied indices included Comprehensive liquidity and net liquidity balance index.

In modern liquidity indexes, for the purpose of considering degree of liquidity of current liability and assets weighting items forming the ratios (comprehensive liquidity index) are applied.

Net liquidity balance index is a novel measure that has been introduced for the purpose of determining liquidity status of companies. In this index, to indicate liquidity status of a company, cash balance and securities have been applied. Developers of this index believe that net liquidity balance index assessment indicates provision of liquidity storage of the company with regards to unpredicted needs. This is because if the company faces lack of liquidity and wants to use other current assets (Inventories and receivables), it has to tolerate some costs. For example, if the company wants to meet probable liquidities from inventories, it has to sell the inventories in emergency with discount. In general, in this method, inventories and receivables of the company would not be considered. In addition, in measurement of net liquidity balance index only notes payable-current liabilities with interest- would be considered as binding debts (Jahankhani & Talebi, 1999).

The index with estimation of weighted average of current ratio can solve problems associated with lack of considering degree of liquidity of current assets and time of repayment of current liabilities (Melyk & Birita, 1974).Hence, using traditional and modern ratios of liquidity can give a better understanding of status of the company.

Investors invest with the hope to achieve more wealth. One of the important factors that investors consider in their decision making is the stock return rate. Return in investment process is a driving force that can create motivation and can be considered as a reward for the investors. In fact, every investor should firstly gain the trust that the origin of asset would be returned in the first stage and then, the expected return would be obtained, so that the investor can make a decision. Stock return depends on several factors such as financial leverage and firm size.

According to importance of this issue, stock market acts as one of the evaluation criteria of economic status of the country. Increase in investment in this market and attraction of capital to the capital market are influenced by creation of desirable conditions for investment including increase in stock returns and decrease in risk. As variables such as liquidity indices can effect on return of stock exchange clearance of the relationship between liquidity variables and stock exchange can pave the way for the future managers and investors for decision making. Therefore, according to the mentioned factors, the main purpose of the present study is assessment of the relationship between novel criteria of liquidity and stock return in listed companies in Tehran Stock Exchange.

Sharifi et al., (2014) have conducted a study under the title of assessment of financial performance using modern liquidity indices. They have conducted the study in 67 companies. The obtained results from testing hypotheses indicated that there is a significant correlation between performance criteria and modern liquidity indices. Batten and Vo(2014) have conducted a study under title of The relationship between liquidity index and stock return in the emerging markets. The results indicate that when a market is not perfectly integrated with global economy, shortage of liquidity is not considered as an insignificant risk factor. Chikore et al., (2014) have conducted a study under the title of liquidity and stock return in Zimbabwe Stock Exchange. The obtained results from the study indicated that changes in stock liquidity play a key role in stock returns. In addition, the results indicated that there is a significant and reverse relationship between liquidity and returns of listed stocks in ZSE.

III. Research Methodology

3.1 *The research method*

This is an applied research, in terms of objective, and a correlative one, in terms of nature. It has a deductive – inductive approach and is classified among all kinds of correlative researches, except for regression analyses. Considering that the data used in the present research are real and historical, it can also be classified among Ex-post Facto.

3.2 *Research period and statistical population*

The statistical population of the research was composed of all the listed companies on Tehran Stock Exchange from 2008 to the end of 2013 (416 companies, 37 industrial groups). The systematic elimination method was employed to determine the study sample. So, all the companies which were member of the statistical population and had the following conditions were considered as the study sample. Any of them that did not meet one of these conditions was eliminated. For this purpose, 5 criteria were taken into consideration and in cases where a company met all these criteria, it was selected as a sample. Here are these 5 criteria:

1. Considering the information needed from 2008, the companies which were listed on Tehran Stock Exchange by the end of March 2008 and their name not been removed from that list by the end of 2013;
2. Companies whose shares, during the desired period, were actively traded in the Stock Exchange;
3. In order to increase the comparability of the study companies, those companies whose financial year should be the end of March 19 without any change in the study period;
4. Companies which were not among financial intermediation companies (investing, holding, leasing, banks, and insurance companies) due to their different performance; and
5. Companies whose required data are available.

By applying the above conditions, a total of 136 companies were selected to estimate models and test hypotheses.

In this research, the necessary data collection was conducted in two phases. In the first phase, the library method was used to formulate the research theoretical bases (by referring to theses and papers in Persian and English in relevant websites); in the second phase, data collection was performed by selecting the necessary information provided in the website of Iran Central Bank and the financial statements of Securities and Exchange Organization (SEO), and other relevant sources of information such as financial databases of Iran, and comprehensive information systems for publishers.

3.3 *Research hypotheses and model*

Hypotheses of the study are presented as follows:

Hypothesis 1:there is significant relationship between comprehensive liquidity index and stock return of the listed companies in Tehran Stock Exchange.

Hypothesis 2: there is a significant relationship between net liquidity balance index and stock return of the listed companies in Tehran Stock Exchange.

To test hypo theses 1 and 2, multivariate regression model has been applied. In this model, stock return is as a dependent variable and the net liquidity balance index and comprehensive liquidity index have been considered as independent variables and firm size and financial leverage are control variables.

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$R_{it} = \beta_1 + \beta_i CLI_{it} + \beta_3 NLB_{it} + \beta_3 SZ_{it} + \beta_4 LVRG_{it} + \varepsilon_{it}$

Where,

R*it*: Stock return of company *i* in year *t*

CLI_{it}: Comprehensive liquidity index of company *i* in year t

NLBit: Net liquidity balance index of company *i* in year t

LVRGit: Financial leverage of company *i* in year t

SZit: Firm size of company *i* in year t

ε_{it} : Model error

3.4 *Measurements of variables*

- Comprehensive liquidity index

This index can solve the problem of lack of considering degree of liquidity of current assets and repayment time of current liability through estimating weighted average of current ratio. Details of the model are presented as follows (Melyk and Birita, 1974):

1) According to degree of liquidity of each current asset, given weight would be allocated to them and their adjusted amount would be calculated. Weight of each asset is the breverse turnover of the asset.
2) Liquidity would take coefficient value of 1 and needs no adjustment, since it is naturally cash.
3) As receivables of a company are far from being cashed, they would be adjusted as follows:

AR= R* (1-(1/TR))

Where, AR: adjusted receivable accounts; R:balance of receivable accounts and TR is receivable accounts turnover.

4) As inventory should be firstly changed into receivable accounts and then to cash, it would be adjusted as follows:

AINV = INV * (1-(1/TR)-(1/TINV))

Where, AINV: adjusted inventory; INV: balance of inventory and TINV is turnover of inventory.

5) For each current liability, adjustment coefficient would be estimated and adjusted amount would be calculated. payable accounts would be adjusted as follows:

APA= PA * (1-(1/TPA))

TPA= PUR/PA

Where, APA; adjusted payable accounts, PUR: total purchase, PA: payable accounts balance and TPA is turnover of payable accounts. However, other liabilities can be also adjusted on the same basis.

6) CLI would be calculated as follows:

CLI= ACA/LCA

Where, CLI: Comprehensive liquidity index, ACA is adjusted current asset and LCA is adjusted current liability.

- *Net liquidity balance index*

NLB would be calculated as follows (Shulman and Cox, 1985):

NLB = (CASH + MKT – AP)/TA

Where, *NLB*: Net liquidity balance, *MKT*: Marketable securities, *NP*: payable notes, *TA*: total assets.

- *Stock Return*

$$R = \frac{(P_{t+1} - P_t) + D}{P_t}$$

Where, *R*: stock return, P_{t+1}: Asset price at the end of period, P_t: Asset price at the beginning of period, D: Dividend

- **Firm Size =** Natural Logarithm of Net Sales.
- **Financial Leverage =** Total Liability/Total Assets.

IV. Research Findings

4.1 *Descriptive statistics*

In this section, and before testing the hypotheses, descriptive statistics relating to the research variables in Table (1) are presented. These statistics provide a schematic view of the research data distribution situation. Presented results indicate that mean (median) of stock returns are equal to 0.39 (0.10); for comprehensive liquidity index equal to 20.33 (13.24); for NLB equal to -0.03 (-0.10); for firm size equal to 13.41 (26.38) and for financial leverage equal to 0.65 (0.63).

Table (1) descriptive statistics of research

Variables	Mean	Median	Max	Min	SD
R	0.39	0.10	13.73	-3.78	1.36
CLI	20.33	3.15	4727.9	-1210.1	2.54
NLB	-0.03	-0.01	0.45	-0.61	0.11
SZ	13.41	13.24	18.54	10.03	1.37
LVRG	0.65	0.63	3.06	0.11	0.26

As it is observed, maximum and minimum values of stock returns are equal to 13.73 (-3.78), for CLI equal to 4727.9 (-1210.1), for NLB equal to 0.45 (-0.61),for firm size equal to 18.54 (10.03) and for financial leverage equal to 3.06 (0.11).

4.2 *Correlation coefficients between the variables*

A correlation coefficient test was carried out to detect the presence and direction of the linear correlation between the variables, and the results are as illustrated in Table (2). The results show that there is no strong correlation between the independent variables.

Table (2) The matrix of Pearson's correlation coefficients between variables

Variables	R	CLI	NLB	SZ	LVRG
R	1				
CLI	* 0.058	1			
NLB	**0.106	*0.91	1		
SZ	* 0.021	-0.037	-0.008	1	
LVRG	**0.141	0.035	**-0.319	-0.049	1

** significant meaning at 1%, * significant meaning at 5%

4.3 *Results of tests to select a proper estimation model*

Limer F-test was used to select the preferred model to test hypotheses, and their results are as shown in Table (3).

Table (3) Results Limer F-test for Research Model

Hypothesis H_0	F data	P-value	Limer F test
:::;"the	0.31	0.90	H_0 is acceptable

In The F- test, Hypothesis H_0 i.e. use of pooled data against the Hypothesis H_1 i.e. use of panel data is presented. Considering the gained level of having a significant meaning from the above table, the results of this test indicate the levels and their investigation are homogenous and have no individual differences. Therefore, use of pooled data is more suitable.

4.4 *Analysis of results and hypotheses testing*

For testing of the research hypothesis, the research model is estimated using pooled data. The results of model estimation are as illustrated in table 4.

Table (4) Results of the Estimations of the Research Model

$R_{it} = \beta_1 + \beta_1 ACR_{it} + \beta_1 NLB_{it} + \beta_1 SZ_{it} + \beta_1 LVRG_{it} + \varepsilon_{it}$

Variables	**Coefficient**	***t* statistic**	**P-Value**
	3.21	4.41	0.00
CLI	0.003	1.57	0.11
NLB	-0.38	-0.80	0.42
SZ	0.02	0.60	0.54
LVRG	-0.20	+1.05	0.28
Coefficient of adjusted determination			0.53
F statistic P-Value		5.03 (0.000)	
Durbin-Watson statistic		1.64	

In table 4, the results of investigations of the multivariable regression model is presented. In considering the significance of the whole model, given that the probability of *F* statistic is smaller than 0.05 (0.000), the significance of the model is confirmed with a confidence level of 95%. Model's coefficient of determination indicates that 53% of stock return of the companies is explained by variables entered in the model. According to the initial results of the model estimation, the value

of Durbin-Watson statistic is equal to 1.64, and since it locates between 1.5 and 2.5, it can be concluded that the residuals are independent.

- Comprehensive liquidity index coefficient (0.0003) with P-value of 0.11 isn't significant and shows that there is no significant relationship between comprehensive cash and stock return. Accordingly, the first hypothesis is rejected.
- Net liquidity index coefficient (-0.38) with P-value of 0.42 has no significant meaning and shows lack of existence of a significant relationship between net liquidity index and stock return. Hence, the second hypothesis is rejected.

V. Conclusion

Hypothesis 1 has investigated the relationship between CLI and stock return. In traditional liquidity indexes, the main focus has been that the more the current assets are compared to the current liability, the better liquidity status of the company would be. In other words, current assets, regardless of their combination, indicate ability of the company payment and current liabilities, regardless of their which combination, indicate cash needs of the company. However, traditional liquidity indexes have some defects such as lack of considering degree of liquidity of current assets and speed of repayment of its current liabilities. For this purpose, CLI has been applied as a modern index for assessment of liquidity of companies, in which through estimating weighted mean value of current ratio, the problem for lack of considering liquidity degree of current assets and repayment time of current liabilities could be solved. As liquidity index is one of the financial ratios for measuring performance of the company, it is expected to observe a significant relationship between CLI and stock return. This is because increase or decrease in liquidity can cause changes in dividends sharing policies, stock prices and finally stock return. However, the obtained results from testing 1 indicate that there is no significant relationship between CLI and stock return. It means that changes in CLI can't determine a certain pattern for effect on stock return. As a result, hypothesis 1 has been rejected. The obtained results from testing hypothesis 1have not been in consistence with findings of Nasirzadeh and Rostami (2012). This is because they have found that CLI has significant correlation with profitability.

Hypothesis 2 has also investigated the relationship between NLB and stock return. In this index, to indicate liquidity status of a company, NLB and securities are considered. The index indicates actual liquidity shortage of the company with regards to unpredicted needs. Hence, the index is the higher; the less shortcomings of liquidity would be under uncertainties. In fact, a trust margin would be created for the stockholders and the investors can also purchase the stocks with more confidence. In addition, it helps managers to have fewer limitations for decision making with regards to profit sharing policies or choosing investment opportunities. However, the results of testing hypothesis 2 show that there is no significant relationship between NLB and stock return. It means that changes in NLB have no significant effect on increase or decrease in stock return. Therefore, it could be mentioned that this index has not been considered by the managers and investors for their decision making. Accordingly, hypothesis 2 has also been rejected. The obtained results from testing hypothesis 2 have not been in consistence with findings of Nasirzadeh and Rostami (2012) too. This is because they had found that NLB has a significant correlation with profitability.

VI. Suggestions for Further Research

Findings of this study can be a guideline for new scopes of research as follows:

- Assessment of the correlation of other Comprehensive liquidity index with stock returns
- Comparative study of the correlation between traditional and modern index of liquidity with stock returns
- Assessment of the correlation between liquidity index and other accounting variables
- Assessing the correlation between modern liquidity indices and stock returns through considering profit sharing policies
- Repeating the study on Non-listed companies and comparing the obtained results with findings of the present study.

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